

**ECONOMICS OF
PHILIPPINE FISHERIES
AND AQUATIC RESOURCES:
A LITERATURE SURVEY**

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TABLE OF CONTENTS

I.	Introduction	1
	A. The Aquatic Resource Base	1
	B. Objectives and Scope of the Study	1
II.	An Economic Conceptual Framework for Analyzing Policy Issues in Philippine Fisheries and Aquatic Resource Management	2
	A. Basic Microeconomics of an Aquatic Resource System..	2
	B. Limited Entry Schemes: Factors to Consider	6
	C. Interphase with Macroeconomic Conditions	8
III.	Literature Survey	8
	A. Marine (Capture) Fisheries	8
	1. Data requirements for limiting entry into capture coastal fisheries	15
	2. Encouraging entry into commercial fisheries	18
	3. Prescribing less destructive fishing techniques.	18
	4. Restoring the productivity of fishery habitat ..	19
	5. Importance of examining determinants of direct production costs and allocation of rents	19
	6. Measuring economic rent and environmental costs ...	20
	B. Aquaculture Fisheries	21
	1. Socio-economic Studies	21
	2. Project Evaluation Studies	22
	3. Input-Output Analysis	22
	4. Technology Adoption	24
	5. Societal Considerations	25
	C. Inland Fisheries	26
	D. Intersectoral and Macroconcerns	26
	1. Credit support	26
	2. Assessing alternative management schemes: the need for a framework	27
	3. Valuing the importance of FARP at the macrolevel	28
IV.	Summary and Recommended Research Priorities	28
	Bibliography	223
	Figure 1 Optimum Level of Resource Development	4

LIST OF TABLES AND ANNEXES

Table 1	Problem Areas for Comparing Management Schemes	7
2	Studies on Capture Fisheries	9
3	Economic Indicators of Selected Aquaculture Studies..	23
4	Selected Indicators on Philippine Fisheries	29
5	Coverage of Studies Inventoried	32
Annex I	Appendix Table 1	
	Philippine Aquaculture Studies: Summary of Findings..	36
II	Abstracts	
	Inland Fisheries	77
	Aquaculture	85
	Marine Fisheries	136

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I. INTRODUCTION

A. The Aquatic Resource Base

The Philippines, being archipelagic in nature, has a water resource area that is many times larger than its land area, and a coastline of 17,460 km. About 82 percent of its provinces border on the sea and of the more than 1,500 municipalities, nearly 65 percent are coastal. Thus, about 55 percent of the population reside along coastal areas and a significant proportion of the rural population depend on fishing for livelihood. As a country that counts as the second largest archipelago in the world with over 7,100 islands, the Philippines' aquatic resources should be considered a significant factor in planning for national and regional development.

B. Objectives and Scope of the Study

The general objectives of this study are: (1) to review literature on the Philippine experience in fisheries and aquatic resources management; and (2) to identify data gaps and prioritize issues where more research is necessary. This paper

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also aims to provide basis for a component of the Research Program on the Economics of Natural Resource and Environmental Policy of the Philippine Institute for Development Studies (PIDS), an economic, policy-oriented research institution. The present focus is thus on the economic aspects of selected policy issues in fisheries and aquatic resource management in the Philippines (FARP).

An economic framework for looking at FARP management is first presented (Part 2), through which existing studies are reviewed (Part 3). Research gaps are subsequently identified and some prioritization is made on those that may be addressed by PIDS (Part 4).

II. AN ECONOMIC CONCEPTUAL FRAMEWORK FOR ANALYZING POLICY ISSUES IN PHILIPPINE FISHERIES AND AQUATIC RESOURCE MANAGEMENT

We provide a conceptual framework for examining issues in FARP in terms of analytical tools of resource and environmental economics. This is done for two reasons: (a) to specifically factor in certain peculiarities of the Philippine aquatic resource system, and (b) to complement the fisheries-specific analytical framework that generally characterizes fisheries economics literature.

A. Basic Microeconomics of an Aquatic Resource System

Whereas fishery biologists have prescribed maximum sustained yield management for fisheries, the application of fishery economic concepts for determining effort levels and hence catch levels, means lower harvest rates than implied by biological concerns. The more conservation-oriented, economic principle for sustained yield management considers not only fish output (and gross revenue) but also accounts for the factors of production required for catching fish which need to be paid for, or which have alternative uses. The maximum economic yield (MEY) criterion, where the difference between total revenue and total catch cost is maximized, thus results in lower fish production level as opposed to maximization of biological yield alone. Thus, contrary to the popular notion of discordance between economic principles and fishery resource conservation, the economic solution to fishery management is expected to result in a more conservation-oriented management.

Notwithstanding such economic optimization, however, certain conditions governing fishery use do lead to non-sustainable fish catch. Foremost is the fugitive nature of the fish and the often uncontrolled open access nature of fisheries which does not assure prudent fishermen of their own future harvest, thereby encouraging overexploitation. This implies that for current fishing to be conservation-oriented, commonly-drawn

rule-making and implementation are particularly marked in this resource's management.

Second, while dissipation of economic rent that arises from overfishing should encourage exit from the industry towards other economic activities, this does not usually occur under conditions of high unemployment and lack of alternatives (Clark 1973). The eventual result therefore is subsistence fishing in most less developed countries.

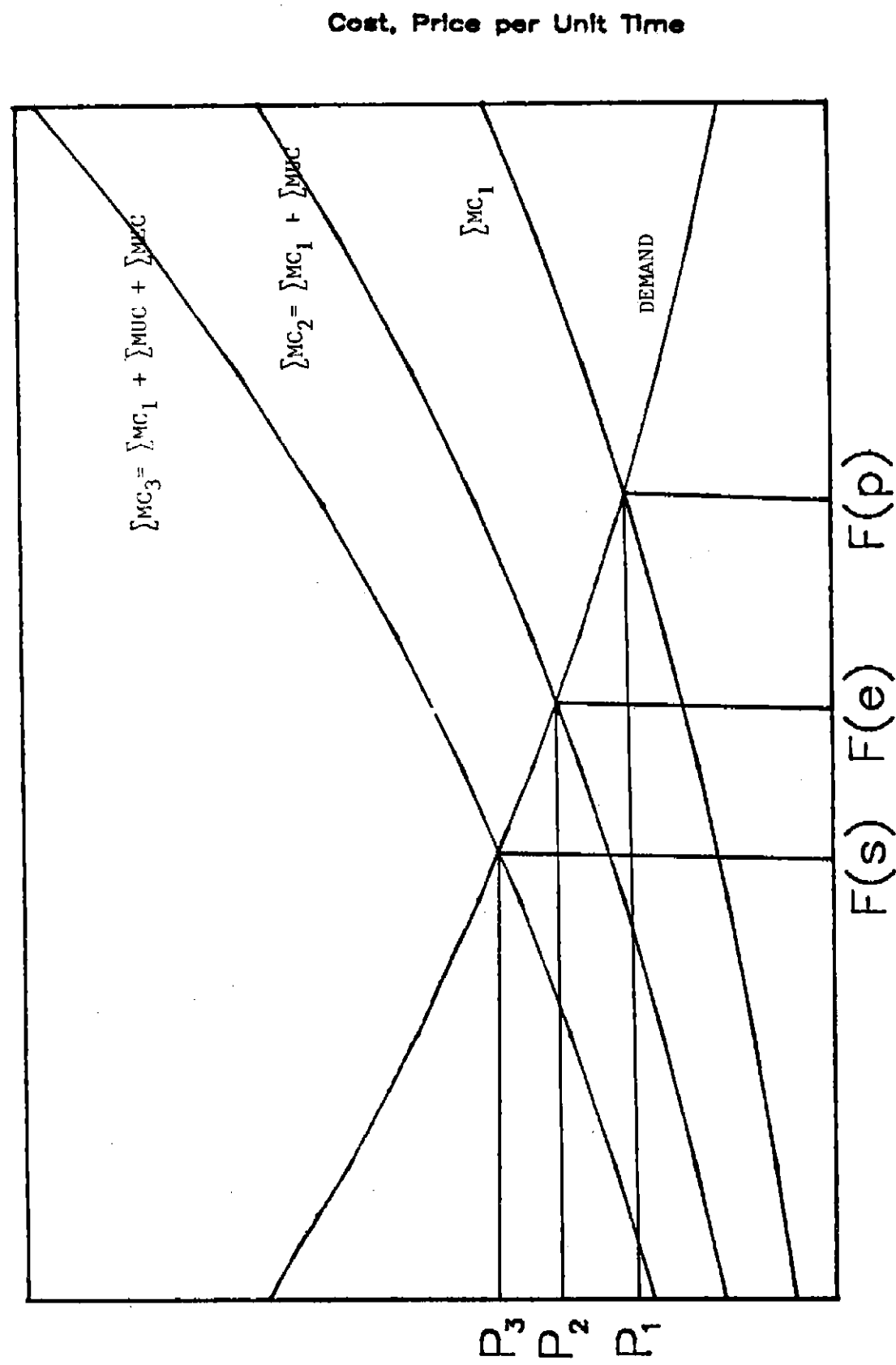
Moreover, from the public perspective, three types of costs are incurred in fishery resource-based activities, namely: (a) the expenses paid on complementary production inputs such as labor and fuel for running motorized boats or private costs; (b) future costs that result from using a smaller resource stock or user cost; and (c) those that result from negative effects of the activity on the rest of the resource system or environmental cost. These costs are important in the following manner:

- (1) private costs are directly borne by the current producer and depend on his decisions on input combinations;
- (2) user costs are experienced by future users who need not be identical with the current user particularly if the latter are not assured of future access to the same resource; and
- (3) environmental costs may be borne by other types of resource users, either at present or in the future, depending on the severity of impact on the rest of the ecosystem.

A public decisionmaker who ideally considers the future generation's welfare and the other resource users' benefits should account for all three types of costs while deciding on how much to produce. He is expected to encourage private decisionmakers to act in accordance with societal considerations through various intervention mechanisms.

Maximizing society's welfare implies producing at level $F(s)$, the equilibrium quantity for the social marginal cost and demand curves indicated in Figure 1. On the other hand, for a private resource user who is not certain that he will have future access to the aquatic resource (particularly with fugitive fishery resources), and who is not concerned with the other commodities/services that may be derived from the resource system, only current, direct production cost matters; his preferred production rate is thus $F(p)$, where private, marginal cost alone is relevant. Somewhere in-between the two is a

Figure 1
Optimum Level of Resource Development



Legend: MC_1 = private marginal cost of production, reflecting marginal opportunity cost of complementary inputs
 MUC = marginal user cost, reflecting change in present value of future costs due to natural resources and environmental scarcity
 MEC = marginal environmental cost

private/public choice $F(e)$, where both private and environmental costs are considered but future costs are ignored. ^{1/}

An extension of this single decisionmaker-specific framework to the industry aggregate, and to society in general, may be derived through the usual aggregation of individual supply (marginal cost) curves. From the public perspective, the cost of supplying an aquatic resource-based product is thus higher if more damage is simultaneously inflicted on the environment.

From this framework, we note that to approximate socially desirable decisionmaking, the following should be considered:

1. Accounting for all factors of production - this implies that measurement of human, capital, and natural resource systems is necessary for proper incorporation by public decisionmakers of the effects on the ecosystem.
2. Such an accounting should allow the measurement of all costs of resource use and their incidence to provide basis for decisions on how the resource system should be allocated. Identification of the key parties involved, their behavior, and the nature of benefits and costs they bear is a requisite to optimum policy formulation.
3. Among the key mechanisms for encouraging private decisionmakers to act in a socially optimal manner are:
 - (a) the restriction of access to decrease the number of resource users and enable a limited number to capture gains from reduced future user costs arising from higher resource stocks [moving from $F(p)$ to $F(e)$ in Figure 1];
 - (b) the encouragement for joint decisionmaking in managing common property-type of resources through organization-building that would lower the costs of obtaining information, of bargaining, and of enforcing the rules so derived; and
 - (c) the use of appropriate resource pricing to encourage resource users to reckon with future scarcity and internalize negative, environmental effects [moving from $F(e)$ to $F(s)$].

Specific conditions of FARP indeed necessitate that this broader analytical framework be employed to supplement the usual

^{1/}

An example of such a private decisionmaker is a fisherman who harvests several types of fishery products but who considers the value of the resource only within his lifetime; a myopic public decisionmaker would also behave similarly.

fisheries economic framework. First, the size of Filipino population using FARP, its dispersed geographic location, and the extent of Philippine marine areas require that localized, commonly decided management regimes supplement, and possibly dominate, national-level agencies tasked with enforcing rules and regulations. Second, the diversity of the country's living aquatic resources implies that significant synergistic relationships are involved in any form of FARP-use.

Thus, attention needs to be paid to the private costs and benefits of fishery use as well as to the scarcity and environmental effects among the various Philippine fisheries and aquatic-based activities.

B. Limited Entry Schemes: Factors to Consider

Economic solutions to overfishing and misuse of aquatic resources differ from the traditional management strategies (e.g., of gear prescriptions, fishing seasons) in that they seek to limit entry to capture fisheries by modifying input and output prices. Examples of these are (a) direct price modification through either a tax on output such as a landings tax or a tax on input such as an effort tax, and/or (b) restrictions on quantity of output through bidding of fisherman's quota, or controlling of input by issuing licenses to effort shares as summarized by Anderson (1980). On the other hand, standard fishery regulatory tools have focused on prescription of specific technologies, fishing area restrictions and catch season limitations.

Application of limited entry schemes, whether as complements to traditional fishery regulation or as alternatives would depend on a number of concerns. These include those summarized by Anderson (1980) in relation to the author's examination of limited entry schemes which we reproduce as Table 1 and which reflect both private and social concerns that were earlier noted.

Appropriateness of management schemes would depend on the local conditions governing resource use. For example, some of the issues are discussed by Panayotou (1982) who notes that while economic controls of tax on effort and catch and license fees may aim to indirectly control fishing effort by directly removing the resource rent, taxes may be counter-distributive as they usually transfer benefits from the low income (where most small-scale fishermen belong) to the average income group. Licenses, on the other hand, tend to be auctioned off to the most efficient operators with access to capital.

With respect to fishing quotas which aim to improve the productivity of the stocks by maintaining a desired level of production --- these may result in negative socio-economic impacts as fishermen successively expand their catching capacity particularly to increase share of quota that is usually based on historical catch levels. The eventual result could be increased fishing costs while the resource rents are completely dissipated.

Table 1
PROBLEM AREAS FOR COMPARING MANAGEMENT SCHEMES

Management Operations

1. implementation
2. flexibility
3. other types of regulation
4. intrafishery conflicts
5. multi-purpose fleet problems

Socio-economic Effects

6. distribution
7. general effects on prices & employment

Biological Effectiveness

8. capability of achieving goals
9. interdependent species

Economic Efficiency

10. vessel and fleet operating efficiency
 11. technological advance
 12. research and regulation costs
 13. freedom on individual participants
-

Source: Anderson (1980), Figure 2, p. 51.

C. Interphase with Macroeconomic Conditions

Impacts of general economic conditions as well as of non-sector specific economic policies on FARP primarily occur through their effects on supply/demand shifts. For example, an increasing number of poor households or higher export demand (rightward shift in demand curve) results in more resource exploitation and higher prices, other factors unchanged, particularly in the short-run.

Technological change that lowers the costs of fishing (rightward shift of marginal cost/supply curves) may result in increased resource-based production. Relative attractiveness of FARP-based products versus other commodity types, and competitiveness of Philippine production versus the same activity in other countries' may also vary according to tax and tariff measures, investment incentives, subsidies and the like. Thus, macroeconomic policies on trade, credit, and exchange rate, among others, are also important vis-à-vis FARP management decisions. The final effects on FARP supplies would be determined by elasticities of supply and demand with respect to changes in their parameters as well as on the usual elasticities of substitution among the various factors of production.

III. LITERATURE SURVEY

Using the simple analytics and problem areas presented above, we now review economic and related literature on FARP. The approach taken is more of taking stock of research as opposed to conducting an interpretative, integrative survey of exhaustively searched literature due to constraints of the study. This paper should thus complement earlier literature surveys which were conducted for other purposes such as those by Smith et al. (1980) on Philippine municipal fisheries, among others.

A. Marine (Capture) Fisheries

Research on capture fisheries in Philippine marine waters may be grouped broadly into: (a) socio-economic studies, (b) industry profiles, (c) stock assessment studies, and (d) production and marketing analyses. These are summarized in Table 2 where the area of study and nature of economic information are likewise indicated. Research studies included in this table pertain mostly to the (private) microeconomic concerns of the fish-related activity under focus such as household characteristics, returns to marketing and the like. For purposes of this review, the research inventory is made in relation to the implied research requirements for operationalizing the framework presented earlier. This will be discussed in the subsequent sections.

Table 2
STUDIES ON CAPTURE FISHERIES

AUTHOR	AREA	RESPONDENTS	MAJOR INFORMATION/FOCUS
A. Socioeconomic Studies			
1. Ardales & David 1986	Iloilo	fishing households	per capita income, poverty factors, survival strategies
2. Bailey 1982	San Miguel Bay	fishing households	census data 1939-80; net outmigration substantial, sharing systems and patterns of ownership of small-scale gears in comparison with small and medium trawlers
1987	Southeast Asia		social consequences of excessive fishing effort
3. Baum & Maynard 1976	Tobuan & Sual, Pangasinan 4 Basilan communities Salay, Mis. Oriental Bayawan, Neg. Oriental 2 communities, Calamian grp., Palawan Philippines	fishing households	baseline information for action-oriented program; SCSP/BFAR studies
4. BFAR/RFTC 1981			socioecon. conditions, production and marketing, technical assistance and training needs
5. Laopao and Latorre 1979	Leyte	fishing households	income level, costs and returns
6. Librero, Catalla, and Fabro 1985	Philippines	municipal fishermen and fish farmers	income level
7. Rabanal 1985	Philippines dev't. projects		artisanal fishing, fishery products fishery development
8. Rau 1981	Mactan Island, Cebu	fishing households	infrastructure, fisheries and socioeconomics of the island
9. Roldan 1980	Philippines		causative factors to poverty and low income of small-scale fishermen
10. Pauly, Mines and Navaluna 1982	San Miguel Bay Philippines	fishing households	catch by gear type and species group technology and socioeconomic conditions, resources exploited, implications to fisheries management and research
11. Smith, Puzon, Vidal-Libunao 1980			historical account, artisanal fishing, stock assessment, trawling
12. Pauly and Mines 1982	San Miguel Bay		economic effects of overfishing
13. Smith and Solon 1987	San Miguel Bay	fishing households	
14. Posadas, Tarrosa and Alminaza 1987	Iloilo	fishing households	social and economic analysis of hulbot-hulbot fishing
15. Smith and Mines 1982	San Miguel Bay	fishing households	gill-netters: cost, returns and sharing systems fish corrals, liftnets and filter nets: costs and returns
16. Kent 1984	Philippines Thailand		review of national fisheries policies of the Philippines and Thailand

Table 2 (cont'd)

AUTHOR	AREA/SCOPE	SPECIE	MAJOR INFORMATION/FOCUS
B. Industry Profile			
1. Aprieto and Ganaden 1987	national	tuna	production and stock assessment
2. Mascialino 1984	national		fishery industry, catch statistics, trade fishery economics
3. Tan 1979	national		characteristics of industry structure, factors affecting level of operational efficiency
4. Yater 1982	San Miguel Bay		problems affecting the small-scale fisheries, possible solutions
5. Hizon 1987	national	tuna	purse seining fleet operations, refrigeration procedures and canning activities
6. Smith 1981	national	milkfish	evaluation of the allegations regarding the imperfections in the fry industry, effects of related fisheries policies
7. Floyd 1986	national	tuna	production, trade and fishing operations
C. Stock Assessment Studies			
1. Floyd 1986	Philippines	tuna	production, trade and fishing operations
2. Hizon 1987	Philippines	tuna	purse seining fleet operations, refrigeration procedures and canning activities
3. Lizarando, Javier, Lucido 1985	Camarines Norte	shrimp, prawn	prospects for production and marketing assessment of the commercial fishery:
4. Philbrick 1987	Marinduque		fish stock, average income of fishermen shellfish catch statistics, shrimp fisheries
5. Belnas 1980	Visayan Sea San Miguel Bay Manila Bay	shrimp	
6. Caddy 1983	Indo-Pacific Region: Australia Coasts Bengal Bay Arabian Sea Philippines Java Sea Indo-Pacific China Sea Yellow Sea East-China Sea South China Sea	cephalopoda	nature of resources and state of exploitation and potential yield estimate of neritic cephalopods

Table 2 (cont'd)

AUTHOR	AREA/SCOPE	SPECIE	MAJOR INFORMATION/FOCUS
7. Dalzell and Ganaden 1987	Philippines	small pelagic fishes	summary of the catches and landings on a temporal and geographic basis, catch by fishing gear, biology and ecology shortcomings of catch reporting system annotated list of the fishes
8. Pauly 1982	San Miguel Bay		
9. Pauly and Mines 1982	San Miguel Bay		analysis of the biological aspects of fisheries over a two-year period, trawl fishery: catch and stock assessment history and present status
10. Pauly, Mines and Navaluna 1982	San Miguel Bay	croaker fish	morphometrics, biology and population dynamics, catch by gear type and species group
11. Silvestre	Samar Sea	multispecies demersal stock	stock assessment
12. Silvestre and Ganaden 1987	Philippines	demersal stocks	landings, potential yield and state of exploitation
13. Villosa and Aprieto 1983	Lingayen Gulf	slipmouths	research cruises from Feb 1978-Jan 1979, catch and stock density
14. Villosa and Hermosa 1982	Samar Sea	demersal trawl fish	survey from Mar 1979-June 1980, abundance, stock density and size of major fish groups
15. Villanoy, Juinio and Menez 1988	Carigara Bay Sulu	giant clams	size frequency distributions, mortality and exploitation rates
16. White 1982	Southern Palawan Philippines	tuna	landings, catch per gear
17. Yesaki 1983	Philippines	pelagic fishes	fish yields for shallow water and deep water fishing zones
D. Production and Marketing			
1. Bailey 1982	San Miguel Bay 641 fishing households (1979-1981)		fishery products socioeconomics, production and marketing
2. BFAR/RFTC 1981	national		socioeconomic status, level of technology and productivity, technical assistance and training needs of small-scale fishermen, fishfarmers and fish processors
3. BFAR/SCSP 1983	Bayawan, Negros Or.		follow-up of the socioeconomic study of Baum and Maynard (1976), socioeconomic profile of municipal fishermen and fry gatherers' households, costs and returns, fish marketing practices
4. Librero, Pabuayon and Tidon 1987	Western Visayas		production and marketing systems
5. Librero, Pabuayon, Tidon Salayo and Reyes 1986	Eastern Visayas		production and marketing systems

Table 2 (cont'd)

AUTHOR	AREA/SCOPE	SPECIE	MAJOR INFORMATION/FOCUS
6. Librero, Pabuayon, Reyes Calabia and Suguitan 1987	Cagayan Valley		production and marketing systems
7. Librero, Pabuayon and Aquino 1986	Bicol		production and marketing systems
8. Lizarondo, Piansay and Bungcayao 1983	Capiz		production, processing and marketing
9. Panayotou 1985	Asia: Bangladesh, Malaysia, Philippines, Sri Lanka, Thailand		socioeconomic conditions, productivity and economic efficiency, cost structure and profitability, marketing, social and institutional constraints, government programmes
10. Posadas, Ty and Seraspe 1986	Iloilo		consumer attitudes, preferences and behavior - demand functions
11. Smith and Mines 1980 1982	San Miguel Bay San Miguel Bay		distribution of total catch and revenues profitability of mini trawlers profitability of small and medium-sized trawlers profitability of Cabusao push nets major gear types, production and marketing dried fish, processing, pricing and marketing
12. Smith, Mines and Banacia 1982	2 communities San Miguel Bay San Miguel Bay		objectives, sampling and analytical methods and data collection methodology of an economic survey of small-scale fishery technology and socioeconomics
13. Smith, Puzon and Vidal-Libunao 1988	Philippines		
14. Yater 1982	San Miguel Bay		field research methodology, characteristics of fishermen and their families
15. Haque and Octavio 1979	Western Visayas 72 commercial operators 309 sustenance fishermen Samar Sea		costs and returns, productivities
16. Saeger 1988			biological effect of trawling ban
17. Smith and Solon 1987	San Miguel Bay		economic effects of overfishing
18. Brucelas 1979	Southeast Asia: Singapore, Philippines Thailand		productivity and costs and earnings of different sizes of fishing vessels
19. Librero and Collier 1979	Southeast Asia: Singapore, Philippines Thailand, Malaysia national		productivity and costs and earnings of different sizes of fishing vessels based on survey undertaken Mar-Aug 1977 BFAR statistics, milkfish culture, trade, prices

Table 2 (cont'd)

AUTHOR	AREA/SCOPE	SPECIE	MAJOR INFORMATION/FOCUS
20. Librero, Ramos, and Lapie 1985	national		economics of small-scale fisheries, costs and returns, income and employment aspects in relation to fishing technology, resource rents
21. Lizarondo and Lucido 1983	Capiz		costs and returns of producing and processing fish by sustenance fishermen
1985	Surigao del Norte		tuna trade, marketing and profitability
22. May, Smith and Thomson 1982	national		technical efficiency of gasoline, kerosene and diesel engines
23. Pichay 1988	national		wholesale prices and increases of regular gasoline and diesel (1972-88), implications and considerations
24. Pichay, and Conanan 1983	national		cost analyses of sample engines running on gasoline, kerosene and diesel, alternative fuel sources and energy-saving devices
25. Anonuevo and Zaragoza 1987	Metro Manila, Cebu, Zamboanga		conducted from January 1981 to July 1982, interviews and surveys among seashell manufacturers, suppliers, traders and gatherers, marketing chain, pricing and promotional strategies
26. Arancillo, Basilio and Papio 1985	Batangas		marketing system, costs and returns
27. Bungcayao, Cea and Lizarondo 1985	Basilan		production and marketing practices
28. Bungcayao and Valdellon 1986	Metro Manila		fish retailing, costs and returns
29. Cuyos and Spoehr 1976	Cebu		study of Pasil Market and Taboan Market, physical characteristics, marketing systems and practices, demand and supply
30. Dela Cruz and Lizarondo 1983	Leyte		tuna marketing: buyers and sellers, costs and returns, market structure, tuna trade
31. Dela Cruz, Arancillo and Bungcayao 1985	Puerto Princesa, Palawan		marketing system
32. FAO/UNDP 1983	Asia: Philippines, Hong Kong, Singapore, Indonesia, Malaysia, Thailand, Sri Lanka, Pakistan		explores dried fish industry country by country, statistical data on production, consumption and foreign trade
33. Javier, Lizarondo and Valdellon 1985	Quezon Province		tuna marketing chains, costs and returns, tuna trade, problems of fishermen
34. Juinio, Meniz and Villanoy 1987	national		commercial use of giant clams, prices, trade
35. Librero 1985	national		review of studies and surveys on fish marketing system, based on secondary data

Table 2 (cont'd)

AUTHOR	AREA/SCOPE	SPECIE	MAJOR INFORMATION/FOCUS
36. Lisac 1980	Philippines, Thailand		study of fishing villages and cooperatives, problems of fish handling, distribution, processing and marketing
37. Lizarondo and Arancillo 1984 1985	Zamboanga del Sur 108 tuna fishermen 35 tuna traders Philippines		marketing practices, problems production and marketing of prawn and shrimps
38. Lizarondo and Valdellon 1985	Philippines		consolidates seven researches conducted in Palawan, Surigao del Norte, Eastern Samar, Basilan, Quezon, Batangas and S. Cotabato description and analysis of tuna marketing system marketing operations of prawn and shrimp operators
39. Lizarondo, Javier and Lucido 1985	Camarines Norte		production and marketing of prawn and shrimps
40. Lizarondo, Maron and Javier 1984	Iloilo		production and marketing of prawn and shrimps
41. Mabunay 1986	Iloilo 6 coastal communities		socioeconomic characteristics, marketing chain, management and disposal of fish catch
42. Navera 1976	Navotas		distribution channel, market structure, profitability
43. Piansay, dela Cruz and Lizarondo 1979	Camarines Sur		marketing operation, sustenance fishing
44. Uwate and Tumaliuan 1985	Metro Manila		survey of retail fish markets, restaurants, and households, demand and supply of seabass, red tilapia and bighead carp
45. Valdellon and Parado 1985	South Cotabato		tuna trading, marketing and production problems
46. Valdellon and Lizarondo 1985	Philippines		marketing operations of shrimp and prawn exporters

1. Data requirements for limiting entry into capture coastal fisheries

That the Philippine coastal fishery resources are overfished is an accepted fact --- the immediate solution of reducing and regulating entry to open access fishery resources is thus one that needs to be immediately tackled by fishery managers.

Philippine management of fishery and aquatic resources has not explored any of the limited entry schemes which ideally help achieve lower fishing costs at a predetermined level of exploitation. Instead, regulations have focused mostly on the traditional schemes such as area restrictions, bans on commercial fishing in coastal waters, and specification of fishing techniques. Assessment of the efficacy of these schemes is, however, virtually absent. For example, Dickson (1987) notes that a five year closed season was implemented in 1981 at the Panguil Bay of Mindanao, affecting fishermen from Regions 9, 10 and 12. Although the ban expired in 1986, no assessment has been made on which to base a subsequent decision on whether the ban should be lifted. According to the same author, the prevalence of immature fish in the area indicates some positive impact on the fishery resource although the extent of socio-economic dislocation likewise needs to be included in the needed assessment.

Most emphasis has been placed by fishery authorities on the regulation of specific fishing techniques such as mesh sizes, dynamite fishing and more recently, muro-ami fishing to insure against these destructive activities, as has traditionally occurred in earlier experience of fishing controls in other countries. A glaring information gap is the extent of these destructive practices. Except for muro-ami fishing, no statistics can be cited with respect to the numbers involved in dynamite and/or cyanide fishing.

Moreover, alternative mechanisms have yet to be studied, among which is the potential allocative role of licensing which seems not to have been fully realized by fishery authorities. Licenses are almost always granted to applicants and the fees are not computed according to the concept of user charges nor economic rent appropriation (Padilla and delos Angeles, forthcoming 1990).

Prescribing the extent of development and the allocation of fishing rights that may be allowed for a potentially renewable resources, both require information on fishery stocks, number of (potential) users, and fishing effort. However, the state of knowledge of fishery stocks is limited to a few major fishing grounds and a few of the many species that characterize the Philippine waters.

The few, noteworthy studies in this regard are those conducted by Smith and Mines (1982) on small trawlers in San Miguel Bay, Dalzell and Ganaden (1987) and Dalzell (1987) on small pelagics, and Silvestre and Ganaden (1987) on demersal stocks where resource rents are estimated in addition to the stock assessments so conducted.

Likewise, few studies measure fishing effort. The noteworthy study here is Dalzell and Ganaden's attempt (1987) to standardize its measurement across vessels and gear types. Information related to fishing effort in specific waters can only be derived from socio-economic surveys of fishing communities, with the presumption that fishermen from such communities are the primary users of the nearby fishing ground. Given the open access, fugitive nature of fishery resources and population densities in coastal communities, estimates based on such information provide, at best, conservative figures on resource use. Indeed, both fulltime and part-time fishing in the municipal fisheries are on the rise, as can be seen later in item four of Table 4. Assuming that no changes occurred in the number of days spent at sea, then these figures strongly indicate increased fishing effort. In addition, overcapitalization in the commercial fisheries has been noted by Librero, Ramos, and Lapie (1985) who measured negative rates of return to motorized boats.

Most socio-economic studies generate information on household characteristics of fishing communities as they are oftenly conducted to provide basis for fisheries development projects. No attempt shall be made here to consolidate findings on income because of differences in estimation procedures across studies. Nevertheless, common findings are the marked poverty of fishing households compared to other households types (e.g., Librero, Catalla and Fabro 1985) and diversified income sources for some of the fishing households.

Because such studies are quite recent (Table 2), the lists from which their random samples were drawn would help provide the historical basis for allocating rights. Additional criteria may then be drawn from a socio-economic study such as diversity of income sources, degree of poverty, number of years engaged in fishing, and the like, particularly for helping community organizations draw their own allocation mechanisms for participation in upcoming fisheries development projects. It is highly probable that upcoming socio-economic surveys that shall be conducted to help implement the Asian Development Bank (ADB) Fisheries Development Loan would suffer from biased responses and participation by nonbonafide respondents. Information from this should therefore be supplemented from previous socio-economic surveys, at the very least. The foremost decision that needs to be made is which among the competing fishing sectors and who among the competing fishermen within the same sector should be favored for specific fishing grounds. On the basis of equity and efficiency, a decision for small-scale fishermen and against

commercial fishermen has been argued (e.g., Agricultural Policy and Strategy Team 1986 and World Bank 1989).

However, given that overcrowding is a natural consequence of open access, fugitive resource use under conditions of few livelihood alternatives, some allocation even within the small-scale fisheries shall be necessary. Additional criteria for further effort reduction and distribution of access to open, coastal fisheries are needed, among which would be economic efficiency, the administrative costs of enforcement and presence of alternative income sources. Table 2, however, shows that virtually no studies have been conducted on alternative income sources nor on the administrative costs of enforcement.

Notwithstanding such data limitations on how much fishing stocks to allocate, fishing rights need to be assigned to start the process of instituting some form of local fishery resource management. It must be noted, however, after the initial allocation shall have been made, that some iteration would be necessary which require continuous monitoring of where fishing is done, by whom, and by which method. To date, only data being generated by the Central Visayas Regional Projects/Nearshore Fisheries Component yield information such as individual fisherman's fishing grounds, gear, number of days at sea, and the like although such have yet to be processed. Such statistics are being considered for inclusion in upcoming agricultural surveys (Philippine Institute for Development Studies-National Statistical Coordination Board 1989) but the question still remains as to whether such monitoring is better assigned to local resource managers versus the national information generation systems alone.

Ideally, a bidding system for allocating fishing rights would result in more efficient (least cost) fish production compared to direct assignment of rights. However, Panayotou (1982) has previously argued that this is inappropriate for subsistence fishermen on the grounds that it tends to allocate rights to those who are already better off. It may also be noted that the great number of production and marketing studies (Table 2) indicate strong linkages between fishermen and traders particularly in credit provision and oligopsonistic arrangements which would lead to distortions in bidding, including unusually high bid prices with speculation. Relatedly, the common practice of "whisper system" and nonprice considerations among the parties involved imply that the fishery product is not always sold to the highest bidder (Librero 1985). In addition, Tan (1979) further notes inequity in access to marketing and storage facilities, e.g., large vessels are concentrated in the Navotas fishing port complex.

These imply that any initial allocation should intentionally correct for market imperfections. For example, with respect to decisions on prioritization of fishing communities, preference

should be made towards poor fishing groups; among the poor, allocation to better organized groups should aim at minimizing costs including transactions costs. ^{2/} However, since existing studies did not aim to make cross-community comparisons on the maturity of organizations, such information would have to be obtained with the help of fisherfolk organizations themselves as well as incorporated in future surveys.

Among the other possible reasons for non-exploration of limited entry schemes are: (a) no integration has been made of the few systematic estimates on fishery stocks and economic rent nor of the optimum number of fishermen that fishing grounds could sustain which should provide the basis for limiting entry or allocating individual catch quotas; (b) no follow-up research has been conducted to implement, even on a pilot basis, the output quotas implied by existing stock assessment results; and (c) there is little appreciation of economic controls for complementing traditional regulatory schemes.

2. Encouraging entry into commercial fisheries

Cruz (1988) has argued in favor of encouraging entry into commercial fisheries to reduce effort in coastal fisheries, redistribute coastal fishing rights in favor of the poor as well as induce higher productivity among commercial fishermen. Gentiles' (1986) domestic resource cost analysis of this sector indeed shows comparative advantage in the commercial fisheries; this is corroborated by the few researches conducted on tuna fishing and shrimp and prawn production (e.g., Javier, Lizarondo and Valdellon 1985; Lizarondo and Arancillo 1984). The distance that needs to be travelled in such fisheries is significant; thus, studies by Pichay and Conanan (1983), and May, Smith and Thomson (1982) focus on the energy efficiency of fishing vessels, and the argument for fuel subsidy has been made. If one considers, however, that positive resource rents from underutilized fishing grounds may still be expected, a fuel subsidy does not appear necessary under the assumption that these rents have not been captured by international vessels poaching in Philippine waters.

3. Prescribing less destructive fishing techniques

As mentioned earlier, most of fisheries management has focused on the regulation of technologies in favor of less destructive ones. Given difficulties in surveillance, the state of coral reefs points to the prevalence of harmful methods such as poison and blast fishing. No systematically gathered information is however available on the extent of destructive

^{2/}

For an example of graphical analysis that incorporates transactions costs, see Bromley (1986).

practices, particularly blast fishing. That dynamite fishing is perceived as a common practice, however, implies that it is attractive in terms of low private costs. As mentioned in the FFARM study, the material costs are subsidized by wealthy patrons and labor costs are only two-thirds of less destructive methods (World Bank 1989, p.39). On the other hand, in terms of societal considerations, this practice results in higher marginal user costs because even younger stocks of the target fish are destroyed, resulting in less fish available in the future. The effects on the other fish species as well as destruction of the coral reefs also imply significant environmental costs.

4. Restoring the productivity of fishery habitat

In addition to overfishing and visible increase in fishing effort, the loss of highly productive shallow water fishery habitats (e.g., coral reefs, mangrove forests, seagrass beds) is considered as a major factor in the decline of nearshore fisheries. To reverse this trend, rehabilitation activities such as the building of artificial reefs in Central Visayas (1989) and local transplantation of seagrass in highly silted areas in Bolinao Bay, Pangasinan (Fortes 1984) are being recommended (Bojos 1990). The only existing study on mangrove rehabilitation is reported by Tomboc (1990) where comparisons of nearshore productivity among three mangrove reforestation sites in the Visayas are reported.

5. Importance of examining determinants of direct production costs and allocation of rents

Apart from the significance of efficiency implications that are derived from cost and earnings data is the relevance of their allocation on resource use rates. For example, it may be argued that depressed prices received by fishermen arising from imperfect market transactions result not only on low incomes but also lead to higher fishing effort since more fish would have to be produced to attain a given level of income. In such case, the economic rent appears to be captured by the monopsonistic traders to the detriment of the fishermen in particular and society in general. Few studies look into such relationships, however, with only Smith et al. (1987) looking into the impact on fishery resource utilization, including types of gear used.

Another unexplored area of research is the significance of multi-specie fisheries in Philippine waters. On the one hand, it is argued that for such resource harvests, "... economies of scale in terms of volume catch per specie does not exist" (Malig 1989, p.10). However, in terms of the potential that multiple production could offer for minimizing risks from price fluctuations and the ability to cater to various needs, including that of the household consumption requirements, basic economic studies still need to be conducted.

6. Measuring economic rent and environmental costs

A number of fisheries inventories have been conducted, most of which are based on fish landing data than on rigorous, stock assessment, few studies for which have been conducted on major fishing grounds such as San Miguel and Lingayen Gulf (Table 2).

The only work done on indirect effects of resource use, from which some valuation of (marginal) user cost or scarcity rent to the overfished fishery resource could be discerned, was conducted recently by Silvestre and Pauly (1988) for demersal (bottom-dwelling) fisheries. Using time series data for annual tuna landings since 1946 and estimates of fishing effort based on a method derived by Dalzell *et al.* (1987), the authors computed for economic rent and arrived at the following findings: (a) maximum economic rent (MER) was reached during the late 1960s; (b) the fishing effort at this level of rent is equivalent to about 40 percent of the (current) 1983-1984 level of fishing effort; and (c) current effort on demersal fish resources therefore needs to be reduced to 1/5 - 3/5 of current levels. The authors add that these results are consistent with earlier findings on biological overfishing in most of the country's fishing grounds.

An earlier assessment of various fishery resource productivity estimates by Smith *et al.* (1981) in fact suggested that we have actually reached the saturation point of fishery yield in most coastal fishing grounds as well as in some offshore areas. Overexploitation of coastal fishery resources may likewise be observed using other indicators such as lower growth rates of municipal and sustenance fish production, declining catch per unit effort (e.g., Dalzell *et al.* 1987), and higher effort in specific areas (e.g., Signey 1987). Specific problems associated with overexploited fisheries have likewise been mentioned by various researchers such as the need to spend longer hours at sea, changes in the composition of catch towards younger fish stocks, and evident damage of coral reefs from various causes.

Interrelationships with other aquatic activities need to be investigated particularly among competing activities. Hodgson and Dixon's work (1988) is the only study that looks at the benefits that may be derived from both fishing and tourism as opposed to logging in a Palawan watershed. Computations included benefits from coastal fisheries, tuna fishing, and tourism in Bacuit Bay versus timber harvests in the nearby watershed; the figures arrived at indicate that larger gross revenues are expected with a logging ban imposed in Bacuit Bay. However, while this study pioneers in its accounting for the off-site effects of erosion on downstream aquatic resources, it does not account for the usual direct production costs of the alternative activities being evaluated. Thus, the conclusion on desirability of banning

logging in the watershed is not conclusive since it is not based on differences of net benefits. ^{3/}

Notwithstanding such constraints, the study does highlight the case for integrated assessment of alternative resource use (in the above case, land and aquatic resource uses) and the importance of natural resource assessment. Information from the latter needs to be integrated with data on coastal communities and interphased with land-based activities as well. A new method, the Geographic Information Systems in Resource Assessment and Planning (GIS), provides data needed for analyzing coastal resources management requirements, including information on pollution and coastline changes (Pheng and Wong 1989).

B. Aquaculture Fisheries

Studies conducted so far on the economics of Philippine aquaculture may be categorized as: (1) socio-economic studies; (2) project evaluation; (3) production function analysis; and (4) technology adoption studies.

1. Socio-economic Studies

Social science research in Philippine aquaculture focused largely on the sociology and economics of a range of aquaculture species such as milkfish, prawns and mussels. As in socio-economic analysis of coastal fisheries, such research generally presents detailed characterization of the fish-raising population under study. For example, Librero (1979) on "Resource Productivity in Milkfish culture in the Philippines (ponds)" and Nicolas and Librero (1979) on "A Socio-economic Study of Fish Pen Aquaculture in Laguna Lake, Philippines" classified the fishpen and fishpond operators as to their ages, sexes and educational attainment. Likewise, technological aspects such as culture and stocking practices being used by the operators were described. Librero concluded that application of farm inputs such as fertilizer, supplementary feeds and chemicals resulted in higher production.

In 1976, an agreement was formalized between the Philippine Center for Agricultural Resource Research Development (PCARRD) and the newly-established Aquaculture Department-Southeast Asian Fisheries Development Council (AQD-SEAFDEC), in order to carry out a comprehensive socio-economic survey of the aquaculture industry. After a three-year period, a total of (26) research reports were completed. These reports presented the socio-economic profiles of fish farmers in the culture of milkfish, oysters, mussels, siganids, carps, catfish and aquaculture

^{3/}

This was brought up by Prof. Lee Anderson during Dr. M. delos Angeles' visit to the University of Delaware in May 1989.

industry in general at the different major productive areas in the Philippines (please see Annex 1). Such studies thus provide a comprehensive profile and benchmark socio-economic data of fishfarmers throughout the country.

2. Project Evaluation Studies

Being an introduced technology, majority of the economic analyses conducted on aquaculture are ex-ante project evaluation studies. Standard measures of feasibility such as net present value (NPV), the internal rate of return, and benefit-cost ratio are usually calculated. A sample of such studies is presented in Table 3 which generally indicate financial feasibility of various aquaculture ventures as well as comparisons of alternative technologies and products.

An important study that examines the effect of government subsidy on profitability was conducted by Macalincag (1971) on a one-hectare oyster farm in Bacoor Bay, Cavite. The study included a comparative analysis of the project as financing method varies. It also evaluated the effect on social desirability of the project by providing for subsidy loan and the effect of income tax deduction on the profitability of such investment. From the private investor's standpoint, an interest rate subsidy of three percent interest on loan resulted in an IRR of 41.20 percent while a tax deduction did not significantly impact on profitability.

Sayson (1984) presented an economic evaluation of shifting from bangus to sugpo farming using the NPV and IRR investment criteria. The project which was the basis for economic assessment was a hypothetical 10-hectare bangus pond system in Buenavista, Bohol covered by a 25-year Fishpond Lease Agreement. The shift from bangus to sugpo farming was found profitable, increasing IRR substantially largely because of wide product price differentials between the two alternative outputs. Aquaculture production has indeed grown considerably over the recent years on account of response to high prices, government credit support, and technical assistance.

3. Input-output Analysis

Analysis of the technical relationships in aquaculture are few. Kee-chai Chong and M.S. Lizarondo (1982) studied milkfish production by estimating a Cobb-Douglas production function that related yield to 11 explanatory variables. The inputs found to be important were (1) stocking of fry and fingerling, (2) age of pond; (3) farm size, (4) fertilizer, and (5) miscellaneous operating costs. Tan 's (1986) work focused on cage culture of tilapia in Sampalok Lake, San Pablo City. It noted the importance of site conditions and stocking density as determinants of yield.

Table 3
ECONOMIC INDICATORS OF SELECTED AQUACULTURE STUDIES

Study (Author, Year, Site, Type)	Indicator	Measure of Profitability				Net Benefit-Investment Ratio	
		NPV		IRR			
		Private	Society	Private	Society B/C PV'/K	Private	Society
<hr/>							
(1)	Locsin & Nakpil, 1984	<hr/>					
	Prawn Production Program, Negros Occidental						
	Intensive Production	P 31,226,375	57,038,576				
	Semi-intensive	15,468,975	24,878,665				
	Extensive	3,461,340	5,590,087				
	Extensive vs. Semi-intensive			44%	45%	6.3	9.5
	Extensive vs. Intensive			25%	35%	3.2	4.6
	Semi-intensive vs. Intensive			22%	28%	2.5	3.5
(2)	Concepcion, 1982	<hr/>					
	Fishpen, Cardona, Rizal						
	1 ha.	P 111,499.40		10.6%	1.9 3.3		
	3 has.	417,419.80		116.2%	2.5 6.5		
	5 has.	704,912.19		160.0%	2.5 7.7		
	Fish Cages, Cardona, Rizal						
	10 x 18 x 3 M	P 23,472.00		260.4%	3.0 10.8		
	10 x 50 x 6 M	122,988.60		184.2%	2.7 8.5		
	3(10 x 50 x 6 M)	368,941.80		184.2%	2.7 8.5		
	6(10 x 50 x 3 M)						
	3(10 x 18 x 3 M)	808,300.05		189.3%	2.7 8.7		
(3)	Bravo, 1976						
	Bangus Pond, Mindoro	P 924,397.00	1,542,779	47%	40%		
(4)	Sayson, 1984						
	Buenavista, Bohol						
	Sugpo	P 404,414.00	920,611	34.8%	35%		
	Bangus	64,719.00	197,989	24.7%	34%		
(5)	Macalincag, 1971						
	Oyster Farming, Bacoar Cavite						
	9% interest on loan	P 23,225.00		41.2%	1.2 1.8		
	12% interest on loan	23,388.00		30.4%	1.2 1.8		

Notes: NPV = Net Present Value
IRR = Internal Rate of Return

B/C = Benefit/Cost Ratio
PV'/K = Present Value per Unit Capital

A different approach was attempted by Gonzales (1981) who studied the milkfish industry by using the transcendental logarithmic cost function. Among the important conclusions are: (a) nursery farms are economically sized at 16 to 40 hectares; (b) elasticities of substitution among factor inputs were 0.96 for fry-labor, 0.92 for fry-pond, 0.89, labor-pond, 0.92, fry-feeds, fertilizer & pesticides (or fry-other variable inputs), 0.90, labor-other variable inputs, and 0.90, pond-other variable inputs. This approach, earlier developed by Binswanger (1975), goes around the usual difficulties of estimating physical measures of inputs, among other advantages.

4. Technology Adoption

Given various intervention mechanisms being put forth to encourage aquaculture production, studies need to be conducted on their importance in inducing technical change. Most studies focus on changes in cost and earning measures to determine desirability and impacts of the activity from the adoptor's perspective. For example, Gonzales (1984) showed that household incomes of participating families in Pipindan, Laguna Lake increased from six thousand pesos to forty-two thousand pesos per year and household savings from about zero to seventy-one pesos per day.

A number of constraints have been identified by various authors. Librero (1988) listed the following four major ones: mortality rates in storage and transport prior to stocking, price of fry and fingerlings being manipulated by the suppliers, exclusion of pond operators from sources of supply, and price inefficiency of the fry distribution system.

A more sophisticated analysis was conducted by Padilla (1986) on the adoption of tilapia culture in traditional milkfish systems in Bulacan. Costs and returns were first analyzed to determine whether the shift from milkfish culture was profit-motivated. Subsequently, to account for other factors affecting farmer's decision, the logit model of innovation adoption was employed. Further, two dependent variables were measured: (1) the decision to culture (or adopt) tilapia; and (2) the extent or intensity of adoption. Among the study's important findings are:

- (a) total yield and revenue are not significant factors since these decreased by 5-6 percent before and after adoption;
- (b) raising tilapia was found to be less input-intensive although it required more labor (22 man-days vs. 20 man-days);
- (c) the shift to tilapia farming was more favorable to marginal milkfish farmers than to average milkfish monoculturists';

- (d) the decision to adopt or reject the innovation was primarily governed by farmers' set of perception of the economic advantage or profitability of tilapia culture; and
- (e) what exerted an influence on the choice of tilapia as an alternate species was whether the fishfarmer had contact with government extension agents and technicians.

5. Societal Considerations

Diversification in aquaculture accelerated in the late 1970s towards the 1980s. In brackishwater ponds, a trend towards prawn culture is notable, accompanied by the development of the prawn hatchery-nursery industry (Israel *et al.* 1986a and 1986b). In freshwater areas, the hatchery and culture of tilapia nilotica in cages have also grown into a level of an industry.

More studies need to be conducted on aquaculture which would look into sources of growth, particularly farm sizes and other inputs such as water. Land and water inputs may serve as limiting factors to the growth of the industry as seen in the problem of increasing land scarcity, probable causes of which are the competing uses of water and the reduction in the latter's quality arising from the presence of effluents from farm inputs. Caution against the use of more intensive culture techniques (e.g., in favor of extensive or semi-extensive) was proposed by Primavera (1990) to lessen the incidence of disease and excessive organic loading.

The substantial volume of literature written on Philippine aquaculture is on socio-economic conditions that characterize aquaculturists. These studies yield information on costs and earnings as well as other indicators (details in Annex 1). Given the industry's current stage of development, more analytical research should be performed that would capture the effects of intervening variables as well as integrate other societal concerns.

Another important aspect that needs to be investigated is government appropriation mechanisms of economic rent. The high IRR figures computed by various studies indicate that some (early) aquaculturists earned above normal profits. Since the farm area used is public property, some of the rent arises from the exclusive use granted them by government and should therefore be properly priced. A related issue is the optimum farm area that should be allowed, given current equity concerns and the country's agrarian reform program.

There is likewise a need to conduct ex-post project feasibility studies to allow for changes in the prices and other external factors.

C. Inland Fisheries

Few economic studies have been conducted on inland fisheries; most researchers focused on characterizing biophysical and ecological aspects of rivers and lakes as later presented in Table 5. The most problematic inland water body, the Laguna Lake, is where various competing users and uses have been identified (e.g., Smith 1983; Gonzales 1988). However, mostly socioeconomic profiles have been conducted for such. Given the importance of identifying various costs and benefits involved, and their incidence for formulating comprehensive lake development, much yet needs to be conducted, particularly on the following concerns: local participation and decentralization needs (Smith 1983), sedimentation (Guerrero 1987), recreational values, and changing resource productivities.

According to Guerrero and Manalili (1988), only Lake Caliraya has been noted for its recreational value while in the case of river systems, Arroyo and San Buenaventura's (1983) empirical work on tourism in Pagsanjan is important in its valuation of impact through various economic tools as well as for its measurement of local effects, both at the municipal and regional levels.

With respect to shifts in resource productivities, the case of Lake Buhi is attributed to the introduction of fish cage culture which was more economically feasible to the erstwhile capture fishermen (Tagarino 1986). With respect to Laguna Lake, equity problems between large-scale fishpen operators and traditional, small-scale open fishermen has dominated the concern of most researchers (e.g., Gonzales 1988). More recent research, however, had begun focusing on lake productivity as affected by pollution and various infrastructure activities.

D. Intersectoral and Macroconcerns

1. Credit support

Substantial credit support was given to Philippine fisheries development in the seventies. Ex-post evaluation studies that have been conducted on its effects do not indicate positive impacts on the quality of life of small-scale fishermen. Librero and Catalla's (1985) survey of 500 fishermen five years after they had availed of DBP assistance in 1974 showed that although increased motorization implied increased fishing capability, fish production did not correspondingly rise. Similarly, Octavio *et al.* (1986) examined the impacts of credit provided by the Biyayang Dagat Program and the KKK, on fishing communities in Region 6 where most of such support was spent. The study's major conclusion is that while credit support enabled fishermen to acquire vessels and equipment, their income did not rise due to increasing competition in fish catch. These results are corroborated by an earlier study by the defunct Fisheries

Industry Development Council (FIDC 1983), which showed very low loan repayment rates.

The results of these studies bring out the need to look into various alternatives for encouraging efficiency, equity, and resource conservation. Cruz (1982), argues that for technological change to occur, favorable conditions should be provided through institutional reform; this implies that focusing on the rules of access could be expected to impact more strongly, and positively, on income levels and resource productivity.

2. Assessing alternative management schemes: the need for a framework

There is indeed a need to evaluate various management regimes, including limited entry schemes, fishing technologies used, and upstream-downstream resource management from a broader framework.

Among the other considerations to focus on are general economic policies that affect the fisheries production as well as its downstream industries. An important study that was conducted from the perspective of economic efficiency and comparative advantage in trade was conducted earlier by Gentiles (1986) using domestic resource cost analysis. The study examined the effects of tariffs (protection) and concluded that positive protection rates were experienced in tuna commercial fishing, tuna canning, the commercial fisheries sector, and the fishpond sector; all likewise exhibited comparative advantage. A follow-up study by the same author (Seligman, forthcoming 1990) which looks into the effects of tariff and nontariff measures during the current import liberalization program shows that local fishermen are heavily penalized by the export tax, canned tuna is highly protected, while shrimp and prawn production are penalized by export taxes. While this research is notable in terms of its application of a methodology that has been significantly applied for analyzing efficiency and trade issues, it needs modification in the set of prices used, which do not reflect shadow values for the fisheries (from the natural resource use perspective). Future follow-up with similar tools of analysis must therefore use real prices in examining efficiency and comparative advantage in Philippine fishery-based industries.

Finally, there is also a need to investigate the interaction between developments in FARP and development concerns such as migration and population pressure. The only empirical work conducted are those on the San Miguel Bay case in the Bicol Region by Bailey (1982) who noted a net out-migration during 1939-1980, on the one hand, and recently, by Lim (1989) who, on the other hand, noted increasing population pressure being brought about by in-migration. These analyses are noteworthy in terms of their coverage of concerns such as the role of women and household level determinants of migration decisions. They

need to be likewise conducted in the other fishing regions to provide information not only of resource stress but also of the influence of intervention mechanisms on household demographic behavior.

3. Valuing the importance of FARP at the macrolevel

Most studies that focus on the significance of FARP in the macroeconomic context use standard indicators such as gross value added and foreign exchange earnings from fishery-based activities, as presented in Table 4.

An approach was attempted in Ng's study (1980) to account for ocean-based gross national product which included both the fisheries output as well as other water-based sectors. Contribution of specific sectors to GNP were estimated as follows: extractive fishery, 5.12 percent value added, water transport, 0.78 percent, fish processing, 0.04 percent, processing of petroleum and coal products, 1.9 percent, and manufacturing of water-based transport, 0.09 percent, altogether comprising 7.93 percent of total value-added in 1974.

While such an accounting is important for highlighting the often undervalued importance of aquatic-based resources, they are estimates which are derived largely from a reclassification of relevant sectors away from the traditional categories under which they are grouped. From the economic framework presented above, the following should also be considered: the benefits of current use of a natural resource is measured not only by valuing the direct benefits of the commodity and services produced and the opportunity costs of complementary factors of production, but also in terms of the user cost, and the offsite, environmental effects of resource degradation. With respect to fisheries, operationalizing this implies taking into account the water ecosystem (including the coral reefs) as well as fish capture itself. Deterioration of the water resource base such as those caused by pollution thus impacts on the fisheries as well as on its other users.

IV. SUMMARY AND RECOMMENDED RESEARCH PRIORITIES

To summarize, a checklist is presented in Table 5 which indicates the coverage of studies included in this literature review. Most research works so far conducted are done from the private perspective, usually in the form of characterization of fishery households and communities, fishing technologies, albeit with little documentation of destructive practices. Consideration of social concerns imply that: there is a need to go beyond mere descriptions of fishery problems; measurement is needed for looking into social consequences of FARP use; and priorities for research should include identification of and

Table 4
SELECTED INDICATORS ON PHILIPPINE FISHERIES

INDICATOR	Y E A R			
	1960	1970	1980	1985
1. Production (Quan. in th. met. tons, value in current mil. pesos)	444.6 (464.4)	988.9 (1,725.2)	1,672.2 (11,644.4)	2,052.1 (31,897.3)
a. Commercial	120.0 (93.6)	381.9 (614.8)	488.5 (3,784.7)	512.0 (7,857.2)
b. Municipal & Sust. Fishing	264.6 (274.6)	510.5 (857.7)	894.6 (6,017.8)	1,095.4 (14,715.7)
c. Aquaculture	60.1 (96.2)	96.5 (252.7)	289.2 (1,841.9)	494.7 (8,724.4)
2. Exports (Quan. in th. kg., value in th. US\$, f.o.b.)	515 (206)	2,429 (2,551)	70,238 (138,075)	58,748 (148,534)
3. Imports (Quan. in th. kg., value in th. US\$, f.o.b.)	53,131 (14,508)	53,131 (16,784)	28,781 (26,460)	5,362 (1,388)
4. Employment				
a. Number of Persons Employed	n.a.	275,003	283,765	n.a.
- commercial	n.a.	36,470	42,976	n.a.
- municipal	n.a.	156,078	87,215	n.a.
- aquaculture	n.a.	82,455	153,574	n.a.
b. Number of Household Members Engaged in Municipal Fishing	n.a.	375,658	1,054,645	n.a.
- full time	n.a.	165,736	366,370	n.a.
- part time	n.a.	153,187	286,564	n.a.
- occasional	n.a.	56,735	401,711	n.a.
5. Number of Fishing Gears Used	n.a.	2,575,907	7,946,224	n.a.
a. Commercial	n.a.	1,915	17,535	n.a.
b. Municipal	n.a.	2,573,992	7,928,689	n.a.

Table 4 (con't)

INDICATOR	Y E A R			
	1960	1970	1980	1985
6. Number of Fishing Vessels	n.a.	231,792	405,241	n.a.
a. Commercial	n.a.	1,915	3,414	n.a.
- motorized	n.a.	1,821	3,230	n.a.
- nonmotorized	n.a.	94	184	n.a.
b. Municipal	n.a.	229,877	401,827	n.a.
- motorized	n.a.	69,428	110,652	n.a.
- nonmotorized	n.a.	156,172	277,536	n.a.
- rafts	n.a.	4,277	13,639	n.a.
7. Average Cost of Operation current terms, (constant, 1978=100)				
a. Commercial Fisheries				
- per boat	n.a.	50,804.18 (1,682.26)	143,347.63 (1,043.29)	n.a.
- per operator	n.a.	93,189.66 (3,085.75)	227,094.57 (1,652.80)	n.a.
- per worker	n.a.	2,667.67 (88.33)	11,387.49 (82.88)	n.a.
b. Municipal Fisheries				
- per boat	n.a.	n.a.	1,642.51 (11.95)	n.a.
- per operator	n.a.	n.a.	1,134.67 (8.26)	n.a.
- per worker	n.a.	n.a.	7,567.55 (55.08)	n.a.
8. Fish Catch/Worker (in metric tons)				
a. Commercial	n.a.	2.44	7.24	n.a.
b. Municipal	n.a.	2.36	9.79	n.a.
c. Aquaculture	n.a.	0.48	0.69	n.a.
9. Output Value (in million pesos)	1,445	5,861	12,264	n.a.
Percent of Industry Group	2.60	3.60	3.00	3.00
Primary	0.87	0.90	0.87	0.78

Table 4 (con't)

INDICATOR	Y E A R			
	1968	1978	1988	1985
11. Demand Ratio				
Intermediate	0.19	0.12	0.16	0.24
Primary	0.81	0.88	0.84	0.76
12. Percent of Industry Group in Composition of Imported Commodities	†	†	0.01	0.01
13. Productivity Rate (in pesos)	6.47	8.61	3.86	3.53
14. Degree of Self-Sufficiency (in percent)	100.60	100.30	101.00	101.00
15. Index of Sensitivity Rank (Forward Linkage Effect)	n.a.	n.a.	0.61 22.00	0.68 18.00
16. Index of Power of Dispersion Rank (Backward Linkage Effect)	n.a.	n.a.	0.75 18.00	0.74 19.00

Notes:

1. Source: NEDA, Philippine Statistical Yearbook, 1988
2. Source: NEDA, Philippine Statistical Yearbook, 1988; Data for 1968 is of 1965
3. Source: NEDA, Philippine Statistical Yearbook, 1988; Data for 1968 is of 1965
4. Source: BAS, Statistical Compendium on Agri., Fishery and Forestry, 1988;
aquaculture - inclds. household members and add'l. workers during peak pd.
5. Source: BAS, Statistical Compendium on Agri., Fishery and Forestry, 1988
6. Source: BAS, Statistical Compendium on Agri., Fishery and Forestry, 1988
7. Source: (basic data) BAS, Statistical Compendium on Agri., Fishery and Forestry,
1988; averages were obtained by dividing total cost by item
8. Source: (basic data) BAS, Statistical Compendium on Agri., Fishery and Forestry,
1988; averages were obtained by dividing total cost by item
- 9-16. Source: NEDA, The Inter-industry Accounts of the Philippines, various years;
data is for 1969, 1974, 1979, 1983; (†) - less than 0.0005

Table 5
COVERAGE OF STUDIES INVENTORIED

Focus	Sector, Year of Study	No. of Studies a/				
		Coastal		Commercial		Aqua
		1971 1980	1981 1990	1971 1980	1981 1990	1971 1980
1. Status/situationer reports (history; bio./phy. conditions manpower dev't; research & extension; data base for planning & credit; problems encountered in these aspects as well as possible solutions)		5	9	2	12	3
2. statistics on catch/production, consumption, stock assessment		4	10	2	10	2
3. socio-economic profile of households		13	22	2	1	21
4. economic analysis of specific fishery project (BCA, IRR)		1	19	4	2	8
5. economic comparisons in terms of costs of productions and return		-	12	3	5	8
6. economic analysis of impacts of fishery policies		1	11		3	2
7. business prospects		-	2	-	2	1
trade & marketing (markets)		6	26	1	10	5
int'l. trade & exports		-	2	-	3	-
processing		1	8	-	4	-
8. technical, operations, designs considerations		-	2	-	-	3
9. fisheries management strategies, policies		1	20	1	10	-
10. development strategies (i.e., to increase fish yields)		1	7	1	-	3

Table 5 (cont'd)

Focus	Sector, Year of Study	No. of Studies a/					
		Coastal		Commercial		Aquaculture	
		1971 1980	1981 1990	1971 1980	1981 1990	1971 1980	1981 1990
11. recommendations for an integrated, multisectoral, regional approach to fishery management		-	3	-	2	-	1
12. need for social science research & dev't. (to attain a sustainable level, etc.)		3	2	3	-	5	-
13. identification of resource utilization conflicts (multiple use; competition; dissipation of rent)		1	10	-	1	-	2
14. fishing effort (data, methodologies)		-	9	-	5	-	-
15. estimation of econ. rent		-	4	-	2	-	-
16. analysis of institutional sys. pattern of ownership & sharing: infrastructure; credit		2	20	1	9	-	3
17. alternative livelihood (i.e., decorative shells)		-	1	-	-	-	-
18. technological change (i.e., hatchery)		-	1	-	1	-	3
19. identification of environmental interactions with fishery resources		-	14	-	2	1	7
20. monitoring of env. resources		-	1	-	1	-	3
21. impact of fishery policy on biomass		1	-	-	-	-	-
Total No. of Studies Inventoried: 228							

a/ Double-counting allowed.

quantification of the incidence of impacts, the time dimension involved (to account for scarcity costs) and the effects on the resource systems (to account for environmental impacts). Notable gaps are information required on management schemes as well as ex-post evaluation of current schemes. For the latter, only the fishery credit program has been empirically studied.

Subsequent focus by the FARP research community is therefore needed on the following:

1. Follow-up research on the significant number of site-specific, socio-economic studies, and a set of socio-economic criteria that could be used as guide in the allocation of access to municipal fishing grounds.
2. In the case of commercial fisheries, there is a need to conduct studies on the private and social profitability of this sector, with due account given to linkages to downstream activities. Existing domestic resource cost studies and measures of comparative advantage need to be modified to allow for proper pricing of the fishery resources as well as the effects of nontariff barriers.
3. With respect to culture fisheries, the allocation mechanism should allow government appropriation of economic rent. Most studies on aquaculture focus on pre-project feasibilities. Subsequent studies should validate measures of feasibility as well as yield information needed for estimating economic rent, and should cover both inland and marine aquaculture.
4. Alternative schemes for managing fishery and aquatic resources need to be evaluated. Such evaluation should examine limited entry schemes, as well as various uses of aquatic resources such as fisheries and water-based recreation, among others. Site specific research of alternatives are required; ex-post analysis should be conducted on critical areas while ex-ante studies for unutilized/underutilized sites should be implemented.
5. There is a general need to continuously monitor the effects and evaluate the impacts of government intervention specific to aquatic resource-based activities (including the fisheries sector) as well as nonsector specific policies which affect water and fishery-based development.

Information needs to be generated on the following:

- (a) welfare conditions of intended beneficiaries;
- (b) state of resources (e.g., whether pressure on overexploited fishing grounds, mangroves, etc., is reduced; whether pollution is increased, etc.);

- (c) impacts on marketing and delivery mechanisms and ultimately, the consuming public.

Economic and societal perspectives are required for these assessments which shall need more information and data processing than those generated by socio-economic surveys.

Coverage should include successful and unsuccessful projects as well as conservation-oriented and destructive activities.

6. There is a need to conduct more research on the factors that lead to variations in the adoption of specific technologies. Such studies would allow initial identification of the early adoptors of conservation-oriented technologies as well as evaluate the importance of intervention mechanisms such as subsidized credit (whether from government, NGOs or traders).
7. Site-specific evaluation of alternative activities needs to be conducted which would allow empirical evaluation of trade-offs among various aquatic-based activities such as mariculture, tourism, waste-disposal for mining effluents, etc. Valuation should allow estimates to be made of the private marginal costs of complementary factors of production, marginal user costs and marginal environmental costs of using natural resources.
8. Since the state of information does not yet allow the estimation of the parameters of economic sustained yield, multi-specie fishery management, and, some allocation of access to fishery resources needs to be conducted despite minimal information on the optimum quotas, fishery stocks data should continuously be gathered to minimize the uncertainties involved in the iterative processes of fishery management, and provide some safeguards on the possible irreversibility of certain decisions.

ANNEX I

Appendix Table 1
PHILIPPINE AQUACULTURE STUDIES: SUMMARY OF FINDINGS

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
1. Ramos, "A Socio-econ. Survey of the Aqua-Culture Ind. of Cagayan Valley" (1978)	139 Respondents Cagayan-91 Isabela-48	Fry gathering	Bangus Elvers	1.12 Bangus fry grounds (seashores, rivermouths) 1.13 Elver grounds (rivermouths)	Fry gatherers: 23 man-days/mo. (Mar-Aug) Elver dealer: 15 man-days/mo. (Oct-Apr) Concessionnaire: 20 man-days/mo.
		Fish farming	Bangus Tilapia Carp Catfish	Bangus farms: 10.27 ha Tilapia farms: 2592 sq m Carp farms: .92 ha Catfish farms: 4287 sq m Combination farms: 3557 sq m	Bangus farms: 13.6 man-days/farm Tilapia farms: 37 man-days/farm Carp farms: 24 man-days/farm Catfish farms: 16.1 man-days/farm Combination farms: 43 man-days/farm Labor came from owner-oper., family & hired labor

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
Ave. value: P47 (catching gear-highest %)	Bangus fry: (for 1974) 24.92 thousand pcs./gatherer	44% of gatherers sold fry to dealers, rest to concessionnaires	1. Fry gathering: (per gatherer/yr) Gross cash returns= 648 Expenses = 619 Cash = 2 Noncash = 617 Ret. over cash exp= 646 Ret. over tot. exp= 29	(per gatherer/yr.) Other occu. = 2703 Fry gathering= 646	1. lack of credit assistance 2. low and fluctuating prices 3. fry shortage
	Elver: (for 1974) 3.05 kg/gatherer	Concessionnaires sold fry to nursery or fishpond oper. Elver dealer sold elvers to eel growers in Bulacan, Batangas, Bataan Fry counted by use of pebbles and similar markers Elvers sold by kilo 56% sold fry within barrio Payment: cash basis	Compared with other regions, the region's net income is the lowest, and about 2 times that of the national level		
Bangus farms: P318/ha (Transpo.: 65%)	Bangus: Pure farms: 330 kg/ha/yr/	Fishes sold by direct retail	Bangus farms: (/ha) Gross receipts= 1816 Expenses = 872 Cash = 710 Noncash = 162 Net earnings = 944	(per operator/yr) Bangus operators: Other occu. = P5722 Farm = P9688	1. Unavailability of technical support 2. unavailability of credit 3. unfavorable price structure
Tilapia farms: P107/half ha (nets: 53%)	bangus-tilapia: 750 kg/ha/yr	Sold within the barrio and in poblacion mkts.	Net earnings = 944	Freshwater pond oper.:	
Carp farms: P140/half ha (tools/equip.:51%)	bangus-carp: 1560 kg/ha/yr		Hired labor was the highest cash expense= P326; while unpaid family labor was the highest for non-cash= P103/ha	Other occu. = P5394 Farm = P469	
Catfish farms: P158/half ha (nets: 61%)	nonfertilized: 2979/ha/yr				
Combination farms: P335/half ha (buildings: 31%)	fertilized: 290/ha/yr		Highest profit obtained by farms with areas 1 ha and below (P5050/ha); the least for farms more than 50 ha (P387/ha).		
	Inorg. fertilizer user: P397 kg/ha				

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
		Oyster farming	Oyster	3678 sq m	189 man-days labor supply from owner and family
2. "Seaweed Farming in the Phil.: A Socio-econ. Study (1979)	Calawisan, Lapu- Lapu City	Seaweed farming		Monoculture: 1.5 ha Polyculture: 4.06 ha	1.8 mo. of man's labor
3. Librero, Masajo, "Mngt. Practices, Costs and Returns in Siganiid Fish- ponds" (1976)	Eighteen farmers Pangasinan- 17 La Union - 18	Siganiid farming	Mataga	1.54 ha	59 man-days/ha

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
	Org. fert. user: 297 kg/ha		Tilapia farms: (/half ha) Gross receipts= 845 Expenses = 506 Cash = 384 Noncash = 202 Net earnings = 339		
	Comb'tn of fert.: 281 kg/ha				
	Total harvesting: 575 kg/ha Selective harvest- ing: P155 kg/ha		Carp farms: (/half ha) Gross receipts= 2851 Expenses = 399 Cash = 270 Noncash = 129 Net earnings = 506		
	Tilapia farms: 94 kg/farm				
	Carp farms: 1031 kg/farm		Catfish farms: (/half ha) Gross receipts= 20 Expenses = 122 Cash = 53 Noncash = 69 Net earnings = 29		
	Catfish farms: 28 kg/farm				
	Combination farms: 5387 kg/farm		Comb'tn farms: (/half ha) Gross receipts= 496 Expenses = 381 Cash = 136 Noncash = 245 Net earnings = 115		
P111/farm (transpo.: 64%)	14 liters/farm	sold by direct whole- sale: w/o shell	Gross receipts= 585 Expenses = 531 Cash = 20 Noncash = 511 Net earnings = 74	Other occu. = P2867 Farm = P74	1. peace and order 2. unfavorable price structure 3. unavailability of culture materials
P604/farm Monoculture: (/ha) P406	Monoculture: (ha/yr) 3321 kg Polyculture: (ha/yr) 328.2 kg	In 1974, 94% sold and remaining used as planting materials sold to restaurants, market and agents	Gross receipts= 3667 Expenses = 1281 Cash = 953 Noncash = 328 Net earnings = 2386	Other occu. = P2867 Farm = P74	1. oil spills from nearby refinery and from barges 2. lack of capital 3. lack of tech'l assistance 4. availability of seed stock
Polyculture: (/ha) P45					
Pure malaga farm: P292/ha (tools/equip: 39%)	548 kg/farm or 1051 kg/ha fertilized pure malaga farms yielded	Sold on a consignment, contractual and whole- sale basis	Pure malaga farm: (/ha) Gross receipts= 8702 Expenses = 2557 Cash = 2181 Noncash = 376	Pure siganid oper.: P8683/yr Comb'tn farm oper.: P4683/yr	

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
<hr/>					
4. Aspuria, Fabio, "A Socio-econ. Survey of the Aquaculture Ind. of Bicol" (1979)	102 respondents Camarines Sur-39 Norte-21 Masbate -42	Fry gathering	Bangus Prawn Crab		Fry gatherer: 21 man-days Concessionnaire: 19 man-days

Fish farming	Bangus	Pure bangus:	Pure Bangus: (/ha)
	Prawn	10.97 ha	17.8 man-days
	Crab		
		Polyculture: 14.09 ha	Polyculture: (/ha) 45.31 man-days
		Pure prawn/ crab: 17.93 ha	Pure prawn/crab: (/ha) 30.96 ha

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
Combination farms: P152/ha (tools/equip: 39%)	4 times as much as nonfert. ponds		Net earnings = 6145 Combination farms: (/ha) Gross receipts= 3421 Expenses = 1982 Cash = 1939 Noncash = 43 Net earnings = 1439		
P28.35 69% handling mat'ls; 66.7 thousand pcs./ 31% catching gear	Bangus fry: (for 1974) gatherer Prawn fry: (for 1974) 3.83 thousand pcs./ gatherer Crab fry: (for 1974) 1000-4000 pcs./mo./ gatherer	66% of the bangus fry bought by concession was sold, remaining was stocked in own nursery and rearing Ponds All crab and prawn fry purchased by concessionaire was sold	Bangus only: (/gatherer) Gross receipts= 1096 Expenses = 883 Cash = - Noncash = 883 Net earnings = 213 Bangus-prawn: (/gatherer) Gross receipts= 2131 Expenses = 1692 Cash = - Noncash = 1692 Net earnings = 439 Bangus-crab: (/gatherer) Gross receipts= 3425 Expenses = 1620 Cash = - Noncash = 1620 Net earnings = 1805 All species: (/gatherer) Gross receipts= 1699 Expenses = 1236 Cash = - Noncash = 1236 Net earnings = 463	(per gatherer/yr) Other occu. = 2675 Fry gathering= 730	1. low supply of fry
P1918/ha of farm land P3409: construction and dev't. P170/ha: farm bldg., handling mat'ls., transportation	Monoculture: (/ha) Bangus: 300 kg/yr Prawn: 55 kg/yr Crab: 476 kg/yr Polyculture: (/ha) Bangus: 280 kg/yr Prawn: 48 kg/yr Crab: 123 kg/yr	4 types of selling arrangements: 1. direct wholesale 2. consignment 3. direct retail 4. by contract 78% sold to wholesalers	Bangus farms: (/ha) Gross receipts= 1288 Expenses = 609 Cash = 570 Noncash = 39 Net earnings = 679 Prawn farms: (/ha) Gross receipts= 981	(per operator/yr) Farm = P13240	1. limited availability of land, capital, manpower and seeds 2. Insufficient technical support in production and marketing 3. difficulties in obtaining credit

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
				All farms: 12.38 ha	All farms: (/ha) 30.07 man-days
5. Nicolas, Pardocho "A Socio-econ. Study of the Aquaculture Industry in C. Visayas" (1979)	132 respondents Bohol: 56 Cebu: 76	Fry gathering	Bangus		Fry gatherers: 80 man-days/season
		Fish farming	Bangus	7.89 ha	128 man-days/rearing or 30.5 man-days/ha

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
	Other: 27 kg/yr		Expenses = 815 Cash = 810 Noncash = 5 Net earnings = 166		
		48% sold within municipal boundaries; 40% within provincial boundaries and 30% outside the province	Crab farms: (/ha) Gross receipts= 3111 Expenses = 862 Cash = 841 Noncash = 21 Net earnings = 2249		
		93% received cash payments	Polyculture: (/ha) Gross receipts= 2658 Expenses = 1132 Cash = 1121 Noncash = 11 Net earnings = 1589		
		Payment for credit lasted for 1 day to a week with no interest			
Fry gatherer: P13.26 (composed mainly of catching and storing mat'ls)	Bohol: 23.9 thousand fry/gatherer Cebu: 21.3 thousand fry/gatherer	Market outlets outside the region are in Manila, Iloilo and Surigao del Norte	Gross receipts = 912 Cash expenses = 124 Cash earnings = 805	(per gatherer/yr) Fry gathering = 805 Other occu. = 2864	1. lack of technical support 2. low and fluctuating price of fry 3. unavailability of credit
Concessionnaire: P532		Counting fry made use of markers. Buyers made use of "comparative density"			
Fry dealer: P50		Payment in cash and at the time of sale			
		Prices high during the start of the season and declines at the peak of season			
		Concessions given through sealed bidding			
P1211 (excluding land; 79% was on farm bldgs.)	1407 kg/farm or 289 kg/ha	95% of prod. sold to market	(per hectare) Gross receipts= 1025 Expenses = 658 Cash = 564 Noncash = 94 Net earnings = 367	Tot. family income: Farm: 1512 Nonfarm: 6424	1. high costs of inputs 2. unavailability of credit
		83% sold harvest to wholesalers; 18% direct to consumers		Earnings from fish-ponds in this region	

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
<hr/>					
		Seaweed farming	seaweed	1.5 ha	Small farms: (/ha) 39 man-days Medium farms: (/ha) 28 man-days
<hr/>					
6. Librero, Lapie "Crab Farming in the Phil.: A Socio-econ. Study" (1979)	61 respondents	Crab farming	crab	Pure crab: 8.8 ha Crab/Prawn: 13 ha Crab/Milkfish: 13.32 Crab/Milkfish/ Prawn: 18.53 ha Crab & others: 7.01 ha	All regions: (/rearing) 31.8 man-days/ha Luzon: (/rearing) 27.5 man-days/ha Bicol: (/rearing) 45.8 man-days/ha Visayas/Min: (/rearing) 6.9 man-days/ha
<hr/>					
7. Librero, Fabro "Socio-econ. Study of Mudfish Culture" (1979)	36 operators Cagayan Valley: 3 Ilocos: 4	Fish farming	Mudfish	1693 sq m	29.5 man-days/farm

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
		Price given to whole-salers was higher than price given to retailers; fish disposed w/in the province		was lowest among all the regions of the country	
	3321 kg/ha/yr	All oper. sold directly to wholesalers from Calawisan, Carbon or Lapu-Lapu, all in Cebu	Ave. gross returns: P1860/ha (ave. price is .56/kg)	Farm: (gross income) P2780/oper. Other occu.: P2290/oper./yr	
		Buyers pick up products from farms Payments were all in cash			
P42377/farm or P2893/ha	Monoculture farm: 339 kg/ha	Almost all of the prod. are sold in wholesale basis at an ave. price of P7.63/kg	All regions: (/ha/yr) Gross receipts= 3882 Expenses = 1398 Cash = 1387 Noncash = 11 Net earnings = 2484	(per oper./yr) Farm: P 2484 Other occu.: P10983	1. unavailability of supply inputs 2. peace and order situation 3. unfavorable price structure 4. insufficiency of operating capital 5. lack of proper infrastructure 6. unpredictable weather 7. unavailability of tech'l support
94% went to land, remaining went to farm bldgs. and transportation	Combination farms: 698 kg/ha Lowest production of pure crab farms was in Luzon (90 kg/ha) and highest in Bicol (476 kg/ha) In crab polyculture, production was lowest in Vis./Min. (382 kg/ha) and highest in Luzon (1182 kg/ha)		Bicol: (/ha/yr) Gross receipts= 2712 Expenses = 1265 Cash = 1262 Noncash = 3 Net earnings = 1447 Luzon: (/ha/yr) Gross receipts= 7139 Expenses = 1862 Cash = 1859 Noncash = 3 Net earnings = 5277 Vis/Min: (/ha/yr) Gross receipts= 2038 Expenses = 1057 Cash = 1013 Noncash = 44 Net earnings = 1057		
P306/farm	206 kg/farm	70% sold, 25% eaten, and 5% given away	Pure mudfish: (/farm) Gross receipts= 335 Expenses = 120	(per oper./yr) Farm: P 494 Other occu.: P5063	1. unavailability of credit 2. lack of technical support 3. lack of seeds
Tools/equip.: 61%	Mudfish: 32% or				

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
	C. Luzon: 24 S. Luzon: 5				
8. Librero et al. "Oyster Seafarming in the Phil." (1976)	163 farmers Cagayan Valley: 6 Ilocos: 99 S. Luzon: 48 W. Visayas: 10	Oyster farming	Oyster	All farms: 2460 sq m Ilocos: 389 sq m Cag. Valley 3678 sq m S. Luzon: 4843 sq m W. Visayas : 10800 sq m	All farms: (/farm) 76.4 man-days Ilocos: (/farm) 43 man-days Cagayan Valley: (/farm) 169.3 man-days S. Luzon (/farm) 122.7 man-days W. Visayas (/farm) 128 man-days

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
farm bldgs. : 20% transpo.: 14% gears: 6%	65 kg Other: 68% or 140 kg	Selling was mostly on retail basis	Cash = 112 Noncash = 8 Net earnings = 215 Mudfish & others: (/farm) Gross receipts= 1110 Expenses = 571 Cash = 417 Noncash = 154 Net earnings = 547		
P440/farm plot: 49% transpo.: 44% containers/equip.: 4%	(per farm; can = 1.4 liters) All farms: 396 cans Ilocos: 165 cans Cagayan Valley: 292 cans S. Luzon: 820 cans W. Visayas: 715 cans	Sold by direct whole- sale, direct retail, or through contract For the country as a whole, more than 50% sold prod. by direct wholesale	All farms: (/farm) Gross receipts= 3737 Expenses = 1290 Cash = 1132 Noncash = 158 Net earnings = 2447 Ilocos: (/farm) Gross receipts= 781 Expenses = 398 Cash = 319 Noncash = 79 Net earnings = 383 Cagayan Valley: (/farm) Gross receipts= 578 Expenses = 519 Cash = 20 Noncash = 499 Net earnings = 54 S. Luzon (/farm) Gross receipts= 10372 Expenses = 2822 Cash = 2561 Noncash = 261 Net earnings = 7550 W. Visayas (/farm) Gross receipts= 3054 Expenses = 3243 Cash = 2997 Noncash = 246 Net earnings = (189)	(per oper./yr) All regions: Farm : 2447 Other occu.: 2418 Ilocos: Farm : 383 Other occu.: 1854 Cagayan Valley: (/farm) Farm : 54 Other occu.: 1449 S. Luzon (/farm) Farm : 7550 Other occu.: 3550 W. Visayas (/farm) Farm : (189) Other occu.: 4645	1. unavailability of space 2. unavailability of capital 3. state legislation 4. water pollution

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
9. Ramos, Lapie "The Cult. of Freshwater Catfish in the Phil." (1979)	43 respondents C. & S. Luzon: 29 La Union: 1 Cagayan: 3 Isabela: 9 Capiz: 1	Fish farming	Catfish	Pure catfish: 1644 sq m Combination: 4950 sq m	Pure catfish: 41 man-days/farm Combination: 38 man-days/farm
10. Librero et al. "Fry Gathering Patterns, Costs and Returns & Socio-econ. Cond...."	229 respondents National	Fry gathering	Bangus Prawn Crab Blvers	Bangus fry: 1.04/gatherer Prawn fry: 1.06/gatherer Crab fry: 1.00/gatherer Blver fry: 1.13/gatherer	18.15 man-days/mo.

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
Pure catfish: P139/farm Farm bldg: 63% Tools/Equip.: 20%	Pure catfish farms: 74 kg/yr Combination: 35 kg/yr catfish 191 kg/yr other fish	In pure catfish farms, 44% was consumed by farm household. In combination farms, 36% was consumed. Majority of prod. was sold by retail The distance of retail outlet was 2 km and 9.7 km for those sold by direct wholesale	Pure catfish: Gross receipts= 365 Expenses = 217 Cash = 159 Noncash = 58 Net earnings = 148 Combination: Gross receipts= 1139 Expenses = 499 Cash = 341 Noncash = 158 Net earnings = 648	Tot. family income: Pure catfish farms: P13784 Combination farms: P5979	1. unavailability of tech'l. support 2. unavailability of credit 3. lack of proper infra-structure 4. flood 5. lack of fingerlings 6. water pollution
P44 (catching gear represented the largest investment)	(/gatherer/year) Bangus fry: 39.74 thousand pcs. Prawn fry: 10.38 thousand pcs. Crab fry: 6.17 thousand pcs. Elver fry: 3.05 thousand pcs.	All fry were sold Bulk of fry gathered passed through middle-men as only 24% sold fry directly to users, the oper. of nursery and rearing ponds 69% sold fry within their barrio of residence or location of fry ground Only 19% of the concessionaires picked the fry from fry ground, 81% of the gatherers delivered to buyers Payment was in cash	Bangus only: (/gatherer) Gross receipts= 1061 Expenses = 928 Cash = 42 Noncash = 886 Net earnings = 133 Bangus-prawn: (/gatherer) Gross receipts= 1525 Expenses = 1529 Cash = 7 Noncash = 1522 Net earnings = (4) Bangus-crab: (/gatherer) Gross receipts= 3375 Expenses = 1627 Cash = - Noncash = 1627 Net earnings = 1748 Prawn only: (/gatherer) Gross receipts= 562 Expenses = 858 Cash = 15 Noncash = 843 Net earnings = (296) Prawn/Crab: (/gatherer) Gross receipts= 1999 Expenses = 596	(/gatherer/yr) Fry gathering: P77 Other occ.: P2225	1. low and fluctuating prices 2. inaccessibility of buyers 3. insufficient storage materials

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVG. SIZE OF LAND/POND	AVG. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
<hr/>					
11. Librero et al. "An Assessment of the Fish- pond Technology & Mngt. in the Prod'n. of Milk- fish in the Phil." (1976)	1175 operators National	Fish farming	Bangus	16.04 ha	

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
			Cash = 65 Noncash = 531 Net earnings = 1403		
			Bel only: (/gatherer) Gross receipts = 351 Expenses = 529 Cash = 5 Noncash = 524 Net earnings = (178)		
	Nat'l. ave. prod'n. 6484 kg/yr/farm 580 kg/ha			Annual income: Owners: P16669 Caretakers: P3467	
	The lowest prod'n was in Ilocos region (2307 kg) & highest in N. Mindanao (13988 Kg)				
	Per hectare, lowest was in W. Min. (168 kg) and highest in W. Vis. (903 kg)				
	Fertilizer using Farm: 8322 kg Non-User: 2850 kg				
	Fertilizer-User: Organic: 570 kg Inorg.: 623 Both : 844				
	Pesticides: User: 664 kg Non-user: 379 kg				
	Harvesting: Total: 615 kg Selective: 426 kg				
	Practiced pond Drying: 582 kg Did not: 538 kg				

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
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12. Librero et al. "Patterns of Fry Purchase & Sale in the Phil.: A Study of Fry Conces. & Dealers" (1976)	75 respondents 25 provinces	Fry purchase & sale	Bangus Prawn Crab Bel	1.43 fry ground /conces. or dealer	Concessionaire: 97 man-days/yr Dealer: 151 man-days/yr
<hr/>					
13. Librero et al. "Aware- ness and Sources of Aqua- culture Tech." (1979)	480 farmers Ilocos: 185 C. Luzon: 196 S. Luzon: 78 Bicol: 21	Fish farming			
<hr/>					
14. Nicolas, Librero "Some Insights into the Socio- Econ. Cond. of Fish Farm	1175 operators National	Fish farming			198 man-days/farm or 16.8 man-days/ha

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
	Practiced pond Levelling: 623 kg Did not: 486 kg Highest yield of farms with 5.01-16 ha farm size				
Concessionnaire: P2057 (71% for vehicles) Dealer: P2345 (76% for vehicles)		Fry counted by pebbles Concessionnaire: Gross receipts= 80618 Fry sold immediately or stored in jars, styro- foam boxes, basins and pails Dealer: Gross receipts= 73308 1.25 million bangus fry purchased by conces./yr dealers bought less than half of this but bought more of prawn fry Buyers consisted mainly of rearing and nursery pond operators Buying season: Bangus: Yr.-round Peak mo.: June Prawn: Mar-Dec Peak mo.: May-Aug Crab: Mar-Oct Elver: Oct-Dec	Concessionnaire: Gross receipts= 80618 Expenses = 46320 Net earnings = 34298 Dealer: Gross receipts= 73308 Expenses = 54938 Net earnings = 18370	Annual income: Concessionnaire: Sale of fry: 34298 Other occu.: 11582 Dealer: Sale of fry: 18370 Other occu.: 9881	1. Low and fluctuating prices 2. BFAR limiting the vol. of sales and inaccessibility of location 3. fry shortage
					1. high costs of inputs
				Annual disposable income: P5958	

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
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Caretakers in the Phil." (1978)					
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15. Fabro, Librero "A Socio- Econ. Study of Mudfish Culture" (1979)	36 operators Ilocos: 4 Cag. Valley: 3 C. Luzon: 24 S. Luzon: 5	Fish farming	Mudfish	5010 sq m	29.5 man-days/farm
<hr/>					
16. Librero et al. "Milkfish Farming in the Phil.: A Socio-econ. Study	1175 operators National	Fish farming	Bangus	16 ha	198 man-days/farm or 16.8 man-days/ha

Appendix Table 1 (cont'd.)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
<p>Nonfarm income: P1495 (caretaker) P1031 (family)</p> <p>Farm: P3432</p>					
P308/farm	206 kg/yr/farm	Out of total mudfish:	(pesos/farm)	(/operator/yr)	1. unavailability of credit
Tools/Equip.: 61%	32% (65 kg) was	556% sold	Gross Receipts= 988	Farm : P 494	and technical assistance
Farm bldgs.: 20%	mudfish and 68%	35% eaten	Expenses = 494	Other Occu.: P5063	2. lack of seeds
Transpo.: 14%	(68 kg) was other	9% given away	Cash = 365		
Catching gears/	species		Non-cash= 129		
hdng. mat'ls: 6%		Usual practice was to	Net Earnings = 494		
	Ave. value of mud-	sell crop unsorted			
	fish was P296 and				
	P692 for other	Majority sold on retail			
	species	basis, within the town			
		Market outlet 5 km far			
Acquisition value: Mat'l. prod'n.:		4 types of selling	National: (pesos/farm)	Family income: (/yr)	1. lack of capital
P4056/ha	6484 kg/farm/yr	arrangements:	Gross receipts= 30957	Farm: P7992	2. lack of suitable areas
Dev't Cost: P4883/ha	580 kg/ha/yr	1. wholesale (61%)	Expenses = 19670	Other occu: P15260	3. lack of manpower
Rental: P494/ha		2. consignment (25%)	Cash = 19390	owner: P12375	4. high costs of inputs
	By region: (/farm)	3. retail (14%)	Noncash = 280	family: 2885	5. lack of fry/fingerling
Other investments:	Lowest: 1417 kg/yr	4. by contract (3%)	Net earnings = 11283		6. lack of tech'l know-how
P215/ha	(C. Visayas)				7. poor infrastructure
	Highest: 13988 kg/yr	60% delivered	By region: (pesos/farm)		8. lack of market
	(N. Mindanao)	Bangus to buyers	Net earnings		9. difficulty in acquiring
			Lowest: 2046		permit
	By region: (/ha)	Charging of delivery	(Reg. VII)		
	Lowest: 168 kg/yr	cost prevalent	Highest: 31762		
	(W. Mindanao)		(Reg. X)		
	Highest: 903 kg/yr	Market outlets:			
	(W. Visayas)	1. W/in barrio (10%)	By region: (pesos/ha)		
		2. W/in town (38%)	Net earnings		
		3. W/in prov. (37%)	Lowest: 361		
		4. Outside prov. (17%)	(Reg. IX)		
			Highest: 1843		
		Method of payment:	(Reg. I)		
		1. Cash (84%)			
		2. Credit (20%)			
		3. Installment (2%)	(pesos/ha)		
			Gross receipts= 2294		
			Expenses = 1458		

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVR. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
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17. Librero et al. "An Econ. Analysis of the Prod'n. of Prawn in Luzon" (1979)	104 operators Ilocos: 5 S. Luzon: 78 Bicol: 21	Prawn farming	Prawn	10.26 ha	
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18. Tidon, Librero "A Socio- Econ. Study of Tilapia Farming in the Phil." (1978)	131 respondents National	Fish farming	Tilapia	Small farm: 251 sq m Medium farm: 3027 sq m Large farms: 2.22 has	Pure Tilapia farms: 32 man-days/farm Tilapia-carp: 39 man-days/farm Tilapia-others: 37 man-days/farm

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
			Cash = 1437 Noncash = 21 Net earnings = 836		
(per hectare)	National prod'n.	99% were sold to the	All farms: (pesos/ha)	(per oper./yr)	1. high price & unavailabi-
Acquisition value: P6372	kg/ha : 243	market	Gross receipts= 2782	Farm : 13394	lity of inputs
Dev't cost: P5599	Ilocos: kg/ha : 379	4 types of selling	Expenses = 1337	Other occu.: P 8624	2. poaching
Rental: P824	S. Luzon: kg/ha : 318	arrangements:	Cash = 1243		3. cannibalism
Other investments: P458	Bicol: kg/ha : 182	1. wholesale	Noncash = 94		4. high cost and unavailabi-
		2. consignment	Net earnings = 1445		lity of laborers
		3. retail	Ilocos: (pesos/ha)		
		4. by contract	Gross receipts= 3562		
	Fert.-user: kg/ha : 357	Average price:	Expenses = 1984		
	Non-user: kg/ha : 161	1. wholesale: P40.39	Net earnings = 1578		
	Chemical-user: kg/ha : 242	2. consignment: P51.43			
	Non-user: kg/ha : 201	3. retail: P53.44	S Luzon: (pesos/ha)		
	Used supplementary feeds: kg/ha : 387	4. contract: P43.35	Gross receipts= 3938		
	Non-user: kg/ha : 202		Expenses = 2029		
			Net earnings = 1909		
			Bicol: (pesos/ha)		
			Gross receipts= 1884		
			Expenses = 792		
			Net earnings = 1092		
(pesos/half ha)	(Kg/half ha)	87 respondents sold	(pesos/half ha)	(per owner/yr)	1. lack of tech'l support
Tilapia: 339	Monoculture: 209	fish to market outlets	Tilapia:	Farm: P806	2. improperly constructed
(40% Farm bldg.)	Polyculture:	as near as 2 km in	Gross receipts= 884	Other occu.: P5238	dikes
Tilapia-carp: 392	Tilapia-carp	Cag. Valley and 3 km	Expenses = 482		3. peace and order
(34% Farm bldg.)	Tilapia: 202	in Ilocos to as far as	Cash = 404		4. lack of capital
	Carp: 186	87 km in other regions	Noncash = 78		5. lack of land suitable
Tilapia-others: 197	Tilapia-others	payment was in cash	Net earnings = 402		for expansion
(52% Tools/equip.)	Tilapia: 112				
	Others: 138	76 of them sold on	Tilapia-carp:		
Tilapia-bangus: 74	Tilapia-bangus	retail basis while 18%	Gross receipts= 1580		
(48% Farm bldg.)	Tilapia: 45	sold on wholesale basis	Expenses = 638		
	Bangus: 89		Cash = 372		
	Others: 33	Of 87 farmers, 62%	Noncash = 266		
		delivered their prod.	Net earnings = 942		
		to buyers.			
			Tilapia-others:		
			Gross receipts= 1028		
			Expenses = 493		
			Cash = 392		
			Noncash = 101		
			Net earnings = 535		

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
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19. Pamulaklakin, Dizon, Ramos "A Socio-econ. Survey of the Aquacult. Ind. of S. Luzon" (1979)	580 respondents	Pry gathering	Bangus Prawn Crab		Gatherer: 19 man-days/yr Concessionnaire: 24 man-days/mo Dealer: 21 man-days/mo
<hr/>					
		Fish farming	Bangus Tilapia Carp Gurami Balag Hito	Bangus farms: 5.66 has 1. Monocult. 5.82 has 2. Polycult. 5.42 has	Bangus Monocult.: 15 man-days/ha Bangus Polycult.: 81.7 man-days/ha Freshwater: 47 man-days/ha Freshwater: 5.64 has 1. Tilapia 10070 sq m 2. Carp 940 sq m

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
<p>Tilapia-bangus:</p> <p>Gross receipts= 782</p> <p>Expenses = 282</p> <p>Cash = 251</p> <p>Noncash = 31</p> <p>Net earnings = 500</p>					
Fry gathering: P68 12.6 thousand pcs.		Fry counted by pebbles and similar markers	Gatherer: pesos/yr Gross Returns: 784 Expense: 15 Net Income: 769	Gathering: P769 Other Occu.: P2395	1. scarcity of fry
Concessionaire: P993 Vehicles: 82%		44% of gatherers sold fry to concessionaires	Concessionaire: pesos/yr Gross Returns: 36326 Cash Exp.: 20391 Net Returns: 15934	Concession: P15934 Other Occu.: P7667	
Dealer: P522 Vehicles: 75%		25% sold to dealers	Dealer: pesos/yr Gross Returns: 91529 Cash Exp.: 69351 Net Returns: 22178	De-ler: P22178 Other Occu.: P4162	
		43% of concessionaires sold fry to rearing oper. while 29% sold to nursery pond			
		69% sold fry within barrio, 17% within neighboring barrios, 14% within their prov.			
		88% of gatherers and all fry businessmen delivered fry to buyers			
		payment in cash			
Bangus farms: P1560/farm or P303/ha 46% Farm bldgs.	Bangus farms: (/ha) 1. Monocult. 471 kg 2. Polycult. Bangus: 379/ha Prawn: 379 kg Crab: 211	Bangus: 4 selling Patterns: 1. Wholesale: P5.02/kg 2. Retail: P5.50/kg 3. Consign.: P3.78/kg 4. Contract: P5.08	Bangus farms: (pesos/ha) 1. Monocult. Gross returns: 1684 Expenses: 1033 Cash: 1001 Noncash: 32 Net income: 651 2. Polycult. Gross returns: 2778 Expenses: 1402 Cash: 1320 Noncash: 82	Bangus farms: 1. Monocult.: P3802 2. Polycult.: P7606 Freshwater: 1. Tilapia: P518 2. Carp: P871 3. Polycult.: P339	1. unavailability of tech'l support 2. high price of inputs
1. Monocult. P1222/farm or P261/ha 52% Farm bldgs.		63% of farmers don't deliver fish to buyers			
2. Polycult. P1898/farm or P346/ha	Freshwater: (/half ha) 1. Tilapia: 145 kg 2. Carp: 1313 kg	26% delivered with charge 19% delivered free			

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
				3. Polycult. 7226 sq m	
		Fishpen	Bangus	Laguna: 5.52 ha Rizal: 6.65 ha	Laguna: 949 man-days/farm Rizal: 71 man-days/farm
		Oyster/Mussel culture	Oyster Mussel	Oyster: 4843 sq m Mussel: 1784 sq m	Oyster culture: 123 man-days/farm Mussel culture: 62.5 man-days/farm

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
42% Farm bldgs. Freshwater: (/farm) P4900 50% Farm bldgs.	3. Polycult. Tilapia: 132 kg Carp: 109 kg Gurami: 37 kg Dalag: 37 kg Hito: 15 kg	60% sold within muni. location 24% outside location 16% within barrio Carp: 63% sold; 19% consumed; 12% given away Tilapia: 81% sold; 9% consumed; 10% given away Retail: 53% Wholesale: 37% Contract: 10% Payment in: cash	Net income: 1386 Freshwater: (pesos/farm) Gross returns: 1175 Expenses: 692 Cash: 540 Noncash: 152 Net income: 483 1. Tilapia Gross returns: 1338 Expenses: 820 Cash: 653 Noncash: 167 Net income: 518 2. Carp Gross returns: 1077 Expenses: 206 Cash: 84 Noncash: 122 Net income: 871 3. Polycult. Gross returns: 1057 Expenses: 712 Cash: 578 Noncash: 140 Net income: 339		
Laguna: P50421 80% Pen San Pablo: P627 78% Pen	Laguna: 3798 kg/ha San Pablo: 6457 kg/ha	Laguna: 99% sold San Pablo: 73% sold, 14% given to laborers as payment 76% wholesale Price/kg highest when sold in contract, lowest on retail	Laguna: (pesos/ha) Gross returns: 15580 Expense: 12091 Net income: 3489 San Pablo: Gross returns: 1750 Expense: 572 Net income: 1178	Laguna: pen: P25058 Other occu.: 10049 San Pablo: Pen: P909 Other occu.: P2372	1. weather conditions 2. insuff. tech'l. support 3. unavailability of fingerlings 4. unavailability of area for expansion
P934 45% plot	Oyster: 820 cans Mussel: 367 cans	97 sold; majority by direct wholesale	Oyster farms: (pesos/farm) Gross returns: 10372 Expenses: 2822 Cash: 2561	Oyster farms: 1. Oper. farm labor earnings: P7495 2. Family from	Oyster culture: 1. water pollution 2. natural disturbances 3. peace and order

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVG. SIZE OF LAND/POND	AVR. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
<hr/>					
20. Ramos, Aspuria "A Socio- econ. Survey of the Milkfish Farmers in B. Visayas" (1979)	18 oper. Southern Leyte: 8 Northern Samar: 10	Fish farming	Bangus	43.33 has	
<hr/>					
21. Librero, et al. "Case Studies of Milkfish Nursery Farms in the Phil." (1979)	6 case studies Bulacan Malabon Capiz	Nursery farming	Bangus	Small: 1 ha Med.: (2-4 ha) Large: (5-9 has)	(ave. of 6 case or less studies) 176.9 man-days/farm

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
			Noncash: 261 Net income: 7550	labor earnings: P7726 3. Total other income: P4410 4. Family income from all sources: P11960	Mussel culture: 1. unfavorable price structure 2. difficulty in obtaining permit
			Mussel farms: (pesos/farm) Gross returns: 4542 Expenses: 1967 Cash: 1908 Noncash: 59 Net income: 2575	Mussel farms: 1. Oper. farm labor earnings: P2485 2. Family from labor earnings: P2492 3. Total other income: P2543 4. Family income from all sources: P5118	
% of Tot. Capital Investment: 1. Transpo.: 43% 2. Farm bldgs.: 36% 3. Nets: 10% 4. Containers: 9% 5. Tools/Equip.: 2%	10613 kg/farm/yr	99% sold After harvest, crop is immediately disposed Retail: P4.98/kg Wholesale: P4.74/kg 87% of oper. delivered crops to buyers, 20% had buyers who picked-up bangus on farm 63% sold within prov'l. location, 38% percent sold as far as 107 km Price highest in Dec. and lowest in Aug.	(pesos/ha) Gross returns: 1292 Expenses: 536 Cash: 527 Noncash: 9 Net income: 756	Owners: Total Annual Income: P9273	1. unavailability of tech'l support 2. high costs of inputs 3. unavailability of fry 4. unavailability of credit 5. robbery 6. unpredictability of weather
(ave. of 6 case studies) P2205 Farm bldg.: 60%	983333 pcs./farm	Majority of oper. sold without sorting Sold either on contract or retail	(ave. of 6 case studies) (pesos/farm) Gross returns: 261252 Cash expenses: 156362 Cash income: 103058 Noncash income: 1595 Net earnings: 104653	(ave. of 6 case studies) 1. Oper. farm labor earnings: P123214 2. Family from labor earnings: P123214	1. lack of capital 2. unavailability of fry 3. water pollution 4. unavailability of fert. & other inputs 5. flood 6. poisoning of stock

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
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22. Banasihan, Pamulaklakin, 89 oper. Aspuria "A Socio-Econ. Study of Carp Cult." (1979)	Ilocos: 14 Cag. Valley: 53 C. Luzon: 13 S. Luzon: 9	Fish farming	Carp	.6277 ha	32.3 man-days/farm
<hr/>					
23. Nazareno, Nicolas. Librero "Milkfish Poly- culture Farming in the Philis." (1979)	219 operators	Fish farming (Polyculture)	Bangus Prawn Crab Siganid Tilapia Seaweed	10.15 has	53 man-days/farm

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
				3. Total other income: P5298	
				4. Family income from all sources: P123708	
P336/farm Tools/Equip.: 41%	Monocult.: (kg/ha) Ilocos: 90 Cag. Valley: 980 C. Luzon: 128 S. Luzon: 2388 Polycult.: (kg/ha) Ilocos: 2060 Cag. Valley: 975 C. Luzon: 328 S. Luzon: 731	84% of crop sold	(pesos/ha) Gross returns: 3857 Expenses: 889 Cash: 601 Noncash: 287 Net income: 2968	Farm: P2968 Other occ.: P5173	1. lack of capital 2. unavailability of land 3. lack of tech'l support 4. limited supply of fry
P3483/ha Land & pond structures: 94%	By species cult.: (kg/ha) 1. Milkfish/prawn: 413.3 2. Milkfish/prawn/crab: 592.5 3. Milkfish/siganid: 574.6 4. Milkfish/crab: 415.9 5. Milkfish/tilapia: 352.6 6. Milkfish/seaweed: 2321.8 7. Milkfish/others: 651.5	Bangus: 4 Selling Patterns: 1. Wholesale 2. Retail 3. Consignment 4. Contract	(pesos/ha) Milkfish/prawn: Gross returns: 3183 Expenses: 1380 Cash: 1362 Noncash: 18 Net income: 1803 Milkfish/prawn/crab: Gross returns: 4312 Expenses: 1576 Cash: 1574 Noncash: 2 Net income: 2736 Milkfish/siganid: Gross returns: 4257 Expenses: 2165 Cash: 2137 Noncash: 28 Net income: 2092 Milkfish/crab: Gross returns: 2028 Expenses: 851 Cash: 815 Noncash: 36 Net income: 1177	Owner Annual Income: P11318	1. unpredictability of weather 2. lack of proper infrastructure 3. lack of tech'l support 4. unavailability and high price of inputs 5. lack of credit 6. theft 7. unfavorable price structure

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)

24. Lapie, Aspuria "A Socio- Econ. Survey of the Aqua- Cult. Ind. in Mindanao" (1979)	220 respondents	Fry gathering	Bangus		Gatherer: 16 man-days/season
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Fish farming		Bangus	24.67 has	18.6 man-days/ha
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Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
			Milkfish/tilapia: Gross returns: 1808 Expenses: 539 Cash: 495 Noncash: 44 Net income: 1269		
			Milkfish/seaweed: Gross returns: 2059 Expenses: 712 Cash: 469 Noncash: 243 Net income: 1347		
			Milkfish/others: Gross returns: 4056 Expenses: 1395 Cash: 1384 Noncash: 11 Net income: 2661		
Gatherer: P16 Catching gear: 56% Handling equip.: 38%		May - Peak month	Gatherer: (pesos/gatherer) Gross returns: 714 Expenses: 912 Net income: (198)	Gatherer: Farm: (198) Other occu.: P1658	1. absence of credit assistance 2. low and fluctuating prices of fry
Concessionaire: P1943 Catching gear: 14% Handling equip.: 13% Vehicles: 73%		All gatherers, concessionaires and dealers received cash payments	Concessionaire: Gross returns: 51740 Expenses: 31791 Net income: 19949	Concessionaire: Farm: P19949 Other occu.: P7054	3. inaccessibility of buyers 4. fry shortage
		Fry buyers of concessionaires consisted mainly of rearing and pond oper. and dealers			
		91% sold fry within barrio			
P4524 (excluding land) Farm bldg: 35% Transpo.: 34%	361 kg/ha	97% of total prod'n went to market Majority sold products on wholesale; 18% sold directly to consumers	(pesos/farm) Gross returns: 30675 Expenses: 15901 Cash: 15476 Noncash: 425 Net income: 14774	Operator: Farm: P14774 Other occu.: P3220	1. insufficiency of capital 2. unavailability of area for expansion 3. unavailability of needed manpower 4. high price of inputs 5. unavailability of tech'l support 6. lack of proper infrastructure 7. unfavorable price structure

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
		Seaweed farming	Seaweed	1.3 ha	80.8 man-days/ha
25. Fabro, Lapie "A Socio-Economic Survey of the Aquacult. Ind. of the Ilocos Region" (1978)	459 respondents	Fry gathering	Bangus Prawn		18 man-days/no.
		Fish farming	Milkfish	Brackishwater: 3.26 has Freshwater: (Monocult.) Tilapia: 4631 sq m Carp: 1191 sq m Mudfish: 463 sq m (Polycult.) 1318 sq m	Brackishwater: (Monoculture) 64 man-days/farm (Polyculture) 45 man-days/farm Freshwater: 19 man-days/farm

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
P2057 Bancas: 52%	191407 kg	Seaweed products were sold to local exporters at an ave. price of P2.04/kg dry weight	(pesos/ha) Gross returns: 23995 Expenses: 10104 Cash: 10071 Noncash: 33 Net income: 13891	Tot. Annual Income: P24818	1. unfavorable price structure 2. peace and order
Gatherer: P81 Catching gear: 53%	(/gatherer) Bangus fry: 18.29 thousand pcs.	78% of concessionnaires hire gatherers to collect fry	Fry gathering: (pesos/farm) Gross returns: 1958 Expenses: 861 Cash: 9 Noncash: 852 Net income: 1097	Gatherers: Gathering: Other occ.: P1819	1. cheating 2. low and fluctuating prices 3. delayed payment
Concessionnaire: P3160 Vehicles: 60%	Prawn fry: 1.68 thousand pcs.	No systematic method of counting fry, thus quantity of fry bought was assumed to be what was sold	Concessionnaire: Gross returns: 68545 Expenses: 46265 Net income: 22280	Concessionnaires: Fry bus.: P22280 Other occ.: P6210	
Dealer: P3360 Vehicles: 86%					
Brackishwater: (Monoculture:) Land: P10000 Dev't. cost: P3251/ha Others: 330/ha	Brackishwater: (Bangus) Monocult.: 2307 kg Polycult.: 3512 kg Freshwater: Tilapia: 80 kg Carp: 32 kg Mudfish: 12 kg	98% sold: crop disposed immediately Majority sold crop by direct wholesale Consignment was also practiced Majority delivered prod. to buyer, the latter bearing the transportation costs Payment was in cash	Milkfish/others: (pesos/farm) Brackishwater: (Monoculture) Gross returns: 15308 Expenses: 7533 Cash: 7261 Noncash: 272 Net income: 7875 (Polyculture) Gross returns: 38917 Expenses: 10126 Cash: 9918 Noncash: 208 Net income: 28791 Freshwater: (pesos/farm) (Monoculture) Tilapia: Gross returns: 385 Expenses: 31 Net income: 354 Carp: Gross returns: 169 Expenses: 85 Net income: 84	Brackishwater: Farm: P18333 Other occ.: P4647 Freshwater: Farm: P185 Other occ.: P2858	1. insufficiency of capital 2. unavailability of area for expansion 3. unavailability of needed manpower 4. high price of inputs 5. unavailability of tech'l support 6. lack of proper infrastructure 7. unfavorable price structure 8. robbery 9. predation & water pollution 10. Insufficient supply of stocks

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
<hr/>					
		Oyster scafarming	Oyster	434 sq m	43 man-days
<hr/>					
26. Tidon 'A Socio-Econ. Survey of the Aquacult. Ind. of C. Luzon' (1979)	370 respondents	Fry gathering	Bangus		1.85 mo./season
<hr/>					
		Fish farming	Bangus	Bangus farms:	Bangus farms:
			Tilapia	20.75 has	327.6 man-days/farm
			Carp	Tilapia farms:	Tilapia farms:
			Gurami	.60 ha	38.5 man-days/farm
			Mudfish	Carp farms:	Carp farms:
				1.65 ha	53.7 man-days/farm
				Mudfish farms:	Mudfish farms:
				1800 sq m	13.8 man-days/farm
				Catfish farms:	Catfish farms:
				200 sq m	51.5 man-days/farm

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
			Mudfish: Gross returns: 108 Expenses: 26 Net income: 82 (Polyculture) Gross returns: 312 Expenses: 93 Net income: 219 (pesos/farm) Gross returns: 781 Expenses: 398 Cash: 319 Noncash: 79 Net income: 363		
P170: Farm Plots: 76% Bancas: 19%	165 cans/farm	97% of prod. sold In general, most of the farmers sold oyster with shell 46% sold prod. by direct wholesale: 33% by contract selling: 21% by direct retail Distance of outlets averaged 3.1 km		1. Oper. farm labor earnings: P373 2. Family from labor earnings: P447 3. Total other income: P3202 4. Family income from all sources: P3585	1. state legislation prohibiting setting of plots in some areas 2. water pollution 3. natural disturbance 4. unavailability of culture materials
P70/gatherer	119.23 thousand pcs./gatherer	All the fry were sold after being sorted Buyers are usually located in the same barrio; the ave. distance of buyer was 11.66 km Concessionnaire based on prevailing price	(pesos/gatherer) Gross returns: 1808 Cash: 451 Noncash: 923 Net income: 734 Milkfish/others:	1/gatherer) Gathering: P734	1. change in weather condition 2. low price of fry
Bangus ponds:	(kg/farm) Bangus: 19608 Tilapia: 282.6 Carp: 182.68 Catfish: 53 Mudfish: 98.08 Gurami: 43.8	Bulk of crop marketed 85% of oper. delivered fish to buyers Delivery was usually without charge Market outlets were usually within towns or prov'l location	Bangus ponds: 1/ha) Gross returns: 2517 Expenses: 1775 Cash: 1767 Noncash: 8 Net income: 742 Tilapia ponds: (pesos/farm) Gross returns: 2383 Expenses: 1149 Cash: 1137 Noncash: 12 Net income: 1234	Other occ.: P15281	1. insufficiency of capital 2. unavailability of area for expansion 3. unavailability of needed manpower 4. high price of inputs 5. unavailability of tech'l support 6. Lack of proper infrastructure 7. robbery 8. predation & water pollution 9. Insufficient supply of stocks

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)

27. Nazareno, Nicolas. Librero "A Socio-Econ. Survey of the Aquacult. Ind. in W. Visayas" (1979)	294 respondents	Fry gathering	Bangus Sugpo	Gatherer: 19 man-days/mo. Concessionnaire: 24 man-days/mo.
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Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/ (11)	PROBLEMS ENCOUNTERED (12)
(7)	(8)	(9)	(10)		
			Carp ponds: (pesos/farm) Gross returns: 775 Expenses: 384 Cash: 251 Noncash: 8133 Net income: 391		
			Catfish ponds: (pesos/farm) Gross returns: 335 Expenses: 270 Cash: 193 Noncash: 77 Net income: 65		
			Mudfish ponds: (pesos/farm) Gross returns: 721 Expenses: 425 Cash: 277 Noncash: 149 Net income: 295		
			Polyculture: (pesos/farm) Gross returns: 1050 Expenses: 838 Cash: 634 Noncash: 204 Net income: 212		
Gatherer: P32 Catching gear: P56	33960 pcs./gatherer	Bangus fry: Year-round buying and selling practiced by concessionnaires May and June peak mos.	(pesos/gatherer) Gross returns: 1251 Expenses: 976 Cash: 59 Noncash: 917 Net income: 275	Gatherer: Gathering: P275 Other occu.: 1773 Concessionnaire: Fry bus.: 77809 Other occu.: 19703	1. pollution of fry grounds 2. illegal fishing 3. increasing number of sabalo caught from the sea 4. bad weather condition
		Sugpo fry: Buying and selling from April to December Distance of buyer to concessionnaire was 143 km	(pesos/concessionnaire) Gross returns: 134536 Expenses: 56727 Cash: 56330 Noncash: 397 Net income: 77809		

Appendix Table 1 (cont'd)

AUTHOR/TITLE	SITE/SAMPLE SIZE	TYPE OF AQUACULTURE INDUSTRY	SPECIES	AVE. SIZE OF LAND/POND	AVE. LABOR REQUIREMENT
(1)	(2)	(3)	(4)	(5)	(6)
		Fish farming		19.95 has	180 man-days/farm
		Oyster seafarming	Oyster	10800 sq m	136 man-days/farm

Notes: a/ current, at year of study

Appendix Table 1 (cont'd)

CAPITAL INVESTMENT	PRODUCTION	MARKET STRUCTURE	COSTS & RETURNS	AVERAGE INCOME (Current Pesos) a/	PROBLEMS ENCOUNTERED
(7)	(8)	(9)	(10)	(11)	(12)
P3687 Farm bldg.: 40% Transpo.: 34%	10860 kg/farm or 854 kg/ha	4 Types of selling arrangement: 1. Wholesale 2. Retail 3. Contract 4. Consignment 63% sold directly to wholesalers Consignment common among big farm oper. (23%) 9% sold to retailers 4% sold by consignment 37% sold within town: 36% sold within prov.: 28% sold to other provinces Distance of market outlets: 179.4 km	(pesos/farm) Gross returns: 47892 Expenses: 30274 Cash: 29869 Noncash: 405 Net income: 17618	Farm: P17618 Other occu.: P44553	1. insufficiency of capital 2. unavailability of needed manpower 3. high price of inputs 4. unpredictability of weather condition 5. lack of proper infra-structure 6. robbery 7. predation & water pollution 8. Insufficient supply of stocks
P1218 Transpo.: 75%	1079 kerosene cans	92% sold Selling in shelled form Majority sold at wholesale basis	(pesos/farm) Gross returns: 4364 Expenses: 3863 Cash: 3586 Noncash: 277 Net income: 501	Farm: P501 Other occu.: P4645	1. peace and order 2. water pollution 3. unavailability of culture materials

ANNEX II

ABSTRACTS

INLAND FISHERIES

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Alabaster, J.S.]

TITLE [Review of the state of Water Pollution affecting inland fisheries in Southeast Asia]

SOURCE [FAO Fisheries Technical Paper (260)., 1986., 25 p.]

ABSTRACT:

Present and future potential problems of water pollution affecting freshwater fisheries in Thailand, Malaysia, Indonesia and the Philippines have been examined, together with current and proposed methods of prevention and control of such problems. Suggestions are offered on future cooperative action that might be taken in the region. These include recommendations for the establishment of a working group on water quality criteria and for the consolidation of information on simple treatment procedures used in the region.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Baluyot, E.A.]

TITLE [Inland Fisheries of the Philippines., p. 130-144]

SOURCE [Reports and papers presented at the Indo-Pacific Fishery Commission Expert Consultation on Inland Fisheries of the larger Indo-Pacific Islands (ed. Petr, T.). Bangkok, Thailand, 4-9 August 1986. FAO Fisheries Report, (371) Suppl., 1987., 258 p.]

ABSTRACT:

The past decade has seen significant changes in the inland fisheries sector of the Philippines whereas before 1976, production from lakes and reservoirs was considered too meager to merit inclusion in the Philippine Fisheries statistics. Today, it contributes about 28% to the total national fish production.

Brackishwater fisheries production, mostly from fishponds built in what used to be mangrove swamplands, has been increasing over the years. These fishponds, which used to be utilized for milkfish mono or polyculture, have been gradually converted into semi-intensive or intensive ponds for the culture of penaeid shrimps, notably *P. monodon*. Shrimp hatchery techniques has also been successfully adapted to Philippine conditions, with the existing hatcheries supplying an increasing larger portion of the shrimp seed requirements of the country's shrimp ponds.

In both the freshwater and brackishwater areas, aquaculture has been responsible for significantly greater fish yields. The fishpens and cages for milkfish and tilapia culture in Laguna de Bay altogether contributed about 80,000 t of fish in 1984, equivalent to approximately 1/3 of the fish requirements of Metro Manila seven million people.

While the prospects are bright for the higher production from both fresh and brackishwater area, mainly through intensification of aquaculture production, there are still certain problems and constraints that need to be resolved in order for the production and feed development for hatchery and culture, and the perennial problem of inadequate technical manpower to man the various set-ups, particularly the shrimp hatcheries.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Baluyot, E.A.]

TITLE [A review of inland water capture fisheries in Southeast Asia with special reference to fish stocking., p. 13-57]

SOURCE [Summary report and selected papers presented at the IPFC workshop on inland fisheries for planners (ed. Petr, T.). Manila, The Philippines, 2-6 August 1982. FAO Fisheries Report, (288)., 1983., 191 p.]

ABSTRACT:

Fish produced from freshwater lakes and reservoirs have been making increasingly greater contributions to the national and regional fishery outputs.

Examples of successful introduction of exotic fish into reservoirs and lakes in the region include those of *Tilapia nilotica* and *Aristichthys nobilis* (bighead carp), *Ctenopharyngodon idellus* (grass carp), *Labeo rohita* (rohu carp), *Hypophthalmichthys molitrix* (silver carp), *Probarbus julieni* successfully established themselves in Thailand's largest reservoir such as Lake Jatiluhur. In the Philippines, exotic fish introductions into natural lakes have been successful, with common carp in Lake Buluan now comprising about 50 percent of the total catch and in Lake Lanao, 12 percent. In Laguna de Bay, milkfish cultured in fish pens have been contributing about 60 percent of the daily fish consumption of the Manila areas. Some introduction have, however, considerably disturbed the ecological balance between species, with near extinction of the sinarapan (*Mistichthys luzonensis*) after the introduction of tilapia in Lake Buhi. In lake Lanao, endemic cyprinids have been threatened by the proliferation of *Glossogobius giccerus* and *Hypsilatrix agilis*, both of which have been accidentally introduced in the lake. Similar cases of species displacement are known for reservoirs in India, where for example *Tilapia mossambica* introduced into the Amravati reservoir displaced *Puntius dubius*. In Bhavanisagar reservoir the introduction of Gangetic major carps and *Labeo calbasu* was followed by the disappearance of the indigenous *Labeo fimbriatus* and *L. bata*.

Fish yields from individual lakes and reservoirs in the ASEAN region range from 39 to 313 metric tons per year (Thailand) with a maximum of 136 kg/ha/yr. Highest catches are those from Lake Bulian in the Philippines (1,600 kg/ha), but the deep Lake Lanao has only 5 kg/ha/yr. Data for Indonesian lakes are 353 kg/ha/yr. and 323 kg/ha/yr for Lake Pateal and Rawa Peninmg respectively, but of only 22 kg/ha/yr for Jatiluhur reservoir. Little is known about Malaysian reservoirs.

In conclusion, inspite of the increase in fish landings, there is common belief that these freshwater resources have not yet been fully exploited. Fish introductions have been one of the management tools for increasing fish catches. In a number of situations, however, introductions have been poorly planned, resulting in existing fishery. Other programmes, though initially successful, eventually failed for lack of sustained efforts. Accurate statistics on stocking strategies and success/failure are mostly unavailable.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Baluyot, E.A.]

TITLE [The Agno Basin (The Philippines)., p. 15-54]

SOURCE [Inland Fisheries in multi-purpose river basin planning and development in Tropical Asian Countries; three case studies (ed. Petr, T.)., FAO Fisheries Technical Paper, (265)., 1985., 166 p.]

ABSTRACT:

The Agno River Basin in Luzon in the Philippines has been under considerable stress from the development activities. The upper catchment has been exposed to drastic and rapid reforestation and to extensive mining, both leading to heavy erosion, high sediment load in the Agno River and situation. In the lower basin, two dams have been constructed for hydropower and irrigation purposes, both of them functioning also as sediment traps. Sediment and heavy metal input through the irrigation system has lowered the soil quality with a resulting negative impact on agriculture of lowland plains. Fish stocks of the upper Agno have never been of commercial significance, but some subsistence fishing has been carried out in the lower Agno, especially during floods. The two reservoirs constructed on the Agno in the 1950's have good fisheries potential but, so far, there has been only a minimal effort spent on their fisheries development. Aquaculture has been the major fish producer in the Agno River Basin, with 16,452 mt (in 1982), of which 12,380 mt came from brackishwater ponds. Brackishwater pond aquaculture of the Agno River Basin contributed 5% of the total brackishwater pond production of the Philippines with 1,200 k/ha/yr, as compared with the national average of 870 kg/ha/yr.

Current effort of government agencies aim at developing fisheries in the Binga and Ambuklao reservoirs, with proposals to construct a new land-based hatchery-nursery complex to provide fingerlings of selected fish for regular reservoir stocking, and to set up a floating cage culture. In spite of that, the brackishwater aquaculture will probably continue to greatly dominate the inland water fish production in the Agno River Basin.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Edra, R.B.]

TITLE [Laguna de Bay - an example of a fresh and brackishwater fishery under the stress of the multiple use of a river basin., p. 119-124]

SOURCE [Summary report and selected papers presented at the IPFC Workshop on Inland Fisheries for planners (ed. Petr, T.). Manila, The Philippines, 2-6 August 1982. FAO Fisheries Report, (288)., 1983., 191 p.]

ABSTRACT:

Laguna de Bay in the Philippines is used as an example of interaction of fisheries with other users. This 90,000 ha lake, situated 15 km southeast of Manila, is annually flushed out during the wet season.

At present, Laguna de Bay is used for capture and aquaculture fisheries, water supply, navigation, disposal of domestic, agricultural and industrial wastes, and for limited irrigation. Two thermal power plants and a

lube-oil refinery use lake water for cooling. Laguna Lake Development Authority (LLDA), which is a regional authority, has the mandate to lead the development of the basin. There are more than 20 additional agencies of the national government which have areas of authority in the basin. A comprehensive water quality management programme has been prepared in 1978 by LLDA, with the help of UNDP, WHO, ADB. This should ameliorate the presently very high input of organic pollutants and assist in a recovery of the fish production. Proposals for increasing the uptake of water for domestic and industrial supply, irrigation purposes, developing ports, and recreation require immediate attention of fishery planners, as it is in the interest of the fishery to rehabilitate the lake production for fish and other fishery products to a level of about 3 years ago, when the commercial landings, inspite of costly investments into fishpen culture, started to decline. The recent losses to fisheries are ascribed to the rapid entrophication which has been taking place in recent years.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Guerrero, R.D., III and E.V. Manalili]

TITLE [Fisheries Management Strategies in two reservoirs in the Philippines, p. 202 (abstract only)]

SOURCE [Reservoir Fishery Management and Development in Asia. (ed. De Silva, S.S.) Proceedings of a workshop held in Kathmandu, Nepal, 23-28 November 1987, Ottawa, Ontario, Canada., 1988., 246 pp.]

ABSTRACT:

Fisheries management strategies for two reservoirs in the Philippines with contrasting management purposes are discussed. Caliraya reservoir, in the Southern Province of Laguna, was constructed in 1939 for hydroelectric power generation. It has a surface area of 1160 ha. Nile tilapia (*Tilapia nilotica*) represents about 76% of the fish catch; largemouth bass (*Micropterus salmoides*), 12%; common carp (*Cyprinus carpio*), 7%; and mudfish (*Ophicephalus striatus*), 5%. Nile tilapia and common carp are stocked by the Philippine Bureau of Fisheries and Aquatic Resources to enhance the catch of about 100 fishermen. Largemouth bass is stocked for recreational fishing. Caliraya Reservoir is the only inland body of water in the Philippines where sport fishing is being promoted. Magat Reservoir was built for irrigating riceland in northern Luzon. It is the second largest reservoir in the Philippines, with a surface area of 4460 ha.. The fisheries of this reservoir is the most productive in the country, with sizes ranging from 4 m x 4 m to 12 m x 4 m, are used for commercial cage culture of Nile Tilapia. By 1986, 785 fish cage units, with a total area of 56.28 ha., were being operated by 212 fish farmers.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Guerrero, R.D.]

TITLE [The status of reservoir fisheries in the Philippines., p. 14-18]

SOURCE [Reservoir Fishery Management and Development in Asia
(eds. De Silva, S.S.). Proceedings of a workshop held in Kathmandu,
Nepal, 23-28 November 1987., IDRC, Ottawa, Ontario, Canada., 1988.,
246 pp.]

ABSTRACT:

The Philippines has extensive reservoir systems that are utilized for hydroelectric power generation, irrigation, and fisheries. Inland fisheries contributes 12.2% to the total fish production of the Philippines. Around 20,000 families are dependent on reservoirs for their food and livelihood. The most common fish caught in Philippine reservoirs are Nile Tilapia, goby, common carp and mudfish. Reservoir fishermen use gill nets, hooks and lines, spears and traps for fishing. Stocking and cage culture of tilapia are also practiced. The major constraints threatening the sustainability of Philippine reservoirs are the high rate of sedimentation and overfishing. Basic studies on the productivity of the water bodies and an assessment of the impact of production enhancement measures are needed. A multisectoral, integrated approach for reservoir fisheries management through a national coordinating action group is recommended.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Petr, T.]

TITLE [Inland fisheries yield of the major Indo-Pacific islands., p. 177-183]

SOURCE [Reports and papers presented at the Indo-Pacific Fishery Commission
Export Consultation on inland fisheries of the larger Indo-Pacific
Islands (ed. Petr, T.). Bangkok, Thailand, 4-9 August 1986. FAO
Fisheries Report (371) Suppl., 1987., 258 p.]

ABSTRACT:

Ten island countries and islands of the Indo-Pacific have been selected for fish review on Inland Fishery Yield. These include the continent of Australia, Fiji, Guam, Indonesia, Madagascar, Mauritius, New Zealand, Papua New Guinea, the Philippines, and Sri Lanka. Development strategies for increasing fishery yields were also cited. These can be grouped into 2: (1) expansion and intensification of fisheries, (2) new or proved management initiatives.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Portugal, A.A.]

TITLE [River basin development in the Philippines. The Bicol River Basin Approach., p. 176-178]

SOURCE [Summary Report and Selected Papers presented at the IPFC Workshop on Inland Fisheries for Planners (ed. Petr, T.), Manila, The Philippines, 2-6 August 1982. FAO Fisheries Report, (288), 1983., 191 p.]

ABSTRACT:

River basins are administered by specific River Basin Development Programmes which are under the umbrella of the National Council for Integrated Area Development (IAD) which is attached to the Office of the Prime Minister. Several IAD programmes have been initiated, such as Cagayan, Bicol, Leyte and Palawan. Bicol River Basin Development Programme of the Government initiated in South Luzon in 1973. It broadly aims at improving the quality of people life through increasing production, employment and income. Bicol area covers some 300,000 ha in Southern Luzon, and a large part of it is subject to floods. The programme involves a number of components, such as flood and salinity control, water balance, land classifications. The request for the feasibility study for fishery development originated from the engineers; the Bureau of Fisheries and Aquatic Resources was involved with the project at a later stage. Experience from the Philippine project suggests that easy recognition of interagency cooperation saves much money and optimizes the output of complex.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Smith, I.R.]

TITLE [Mismanagement of inland fisheries and some corrective measures., pp. 88-100]

SOURCE [Summary report and selected papers presented at the IPFC workshop on inland fisheries for planners (ed. Petr, T.), Manila, The Philippines, 2-6 August 1982. FAO Fisheries Report, (288), 1983., 191 p.]

ABSTRACT:

This paper outlines the major characteristics of most inland fisheries -- open-access, dissipation of resource rents and externalities -- that provide the rationale for managing them. The case of Laguna de Bay, a large lake in the Philippines, is cited to highlight the detrimental effects that overfishing and competition between capture and culture fisheries with no effective restrictions on use of the lake can have on the distribution of benefits from the fisheries. The major tasks of management are enumerated and it is argued that decentralization of authority and participation of local fishermen in decision-making are necessary ingredients for successful management of inland fisheries.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Tagarino, R.N.]

TITLE [Diagnostic Assessment of Lake Buhi fishery resource system, Bicol Region, Philippines., p. 693-698]

SOURCE [Proceedings, International Conference on Fisheries, 10-15 August 1986, (ed.Germa)University of Quebec at Rimonski, Canada, Vol. II., 1986., pp. 567-1223]

ABSTRACT:

This paper summarizes the results of the Lake Buhi system-analysis component of the Agroecosystem Analysis Project covering the watershed, Lake Buhi, Tabao River, and Irrigation Service Area subsystem undertaken during the last quarter of 1985. The component aimed at identifying the research and development priorities for the Lake Buhi that will lead to improvements in the productivity of the lake and the livelihoods of the people on a stable, sustainable, and equitable basis.

Current major use of the lake include water transport, hydroelectric power, irrigation, fishery and agriculture. Interviews with key informants revealed that fishing (capture and culture), farming, employment in public businesses, and self-employment are the major sources of livelihood of the people in Buhi.

Lake Buhi as a fishery resource can be characterized as a multi-agencies fishery. The number of fish capture operators declined significantly from 2,250 operators in 1977 to only 700 operators in 1985. Attributed mainly to declining profitability. The average catch per fishing trip in 1982-83 of 9.23 kg decreased to only 2.5 kg. in 1985. Fish cage also decreased the available area for open waterfishing. Production data suggest that open fishery was not yet over exploited and fish culture technology was not yet fully tapped in 1982-83. Cost and return analyses of fish production in 1982-83 indicate that fish capture was more profitable than fish culture. Recent estimates, however, suggest an increased profitability of fish cage culture which is one major reason for the proliferation of cages in the lake. There is no significant difference in the marketing of harvested fish from fish culture and capture.

The key variables and processes have been identified which may positively or negatively affect the lake agroecosystems properties of productivity, stability, sustainability and equitability. Key questions for research and development were presented and assessed in the workshop indicated the properties most likely affected.

SECTION [INLAND FISHERIES (CAPTURE)]

AUTHOR [Zafaralla, M.T.]

TITLE [Conflicts between Fisheries and Mining, Industrialization and Pollution of Inland Waters in the Philippines. p. 83-87]

SOURCE [Summary Report aand Selected Papers presented at the IPFC Workshop on Inland Fisheries for Planner.(ed. Petr. f.), Manila, The Philippines, 2-6 August 1982. FAO Fisheries Report, (282), 1983.. 191 p.]

ABSTRACT:

In the Philippines, numerous mines discharge some 190,000 metric tons of tailings and 371,600 t of mine wastes daily, mostly into the inland waters and coastal seas. In the Ilocos Region of Luzon, the Abra river receives 47,300 t, the Agno 26,400 t daily. Overflow of tailings ponds is not uncommon in a country visited by frequent tropical storms; it results in fish kill and deterioration of water quality.

Amongst some 3,295 industrial firms in the Philippines, 469 have no waste treatment plant. One of the most polluted rivers is the Pasig traversing Manila. Fishing there is possible only after lake waters from Laguna de Bay flush out the river into the sea, and this depends on the strength of typhoons, as a result of which the water level in Laguna de Bay rises. Industrial pollution of the rivers Palico and Bagbag resulted in complete stop in fishing by 300 fishermen families.

In Laguna de Bay an eutrophication process is advanced and results in summer fish kills. The reasons for fish kills have been investigated by a number of agencies. An hydroclic control structure is nonregulating the inflow and outflow of the water quality which in turn should enhance the fishery. However, it is feared that prevention of input of saline water may also reduce the lake productivity.

The recommendations for water quality improvement include the review of river classification with regard to their use, the sector, and strict enforcement of regulations. The discussion has shown that there is a need for speeding up procedures to solve potential crucial conflicts before it is too late. If other users do not think about fisheries, fisheries must think about other users.

AQUACULTURE

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [ADB-FAO]

TITLE [High-valued Finfish Markets in Hongkong, Singapore, and Japan]

SOURCE [Joint ADB-FAO/SCSP Infofish Market studies., Vol. 8., 1983., pp. 23]

PUBLISHER [South China Sea Fisheries Development and Coordinating Program.,
Manila, Philippines]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [ADSEA]

TITLE [Seminar on Aquaculture Development in Southeast Asia]

SOURCE [1987]

PUBLISHER [Aquaculture Department, Southeast Asian Fisheries Development
Center., Tigbauan Iloilo, Philippines]

SECTION [ECONOMIC APPRAISAL]

AUTHOR [Agbayani, R., Franco, N., Israel, D., Pena, D. de la, Young, A.T.]

TITLE [The production economics of an integrated prawn hatchery-floating nursery
project]SOURCE [Proceedings of the First International Conference on the Culture of
Penaeid Prawn/Shrimps., Iloilo City, Philippines, 4-7 December 1984
eds. Taki, Y., Primavera, J.H., Llobrera, J.A., 1985., p. 184]

ABSTRACT:

An economic evaluation was made of an integrated prawn (*penaeus Monodon*) hatchery-floating nursery project using standard economic tools and methods of analysis. The data used in the analysis were taken from SEAFDEC-AQD experience of the Bataan, Aklan Research Substation hatchery-floating nursery project which is a profitable culture system. The rate of return on investment for this integrated project ranges from 29 to 47% while payback period ranges from 1.8 to 2.6 years.

A separate economic analysis of a hatchery project and a floating nursery was also undertaken to determine the profitability of an independently operating subsystem.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Alexander, Lewis]

TITLE [Marine Regionalism in the Southeast Asian Seas]

SOURCE [Research Report No. 11., 1982., p. 85]

PUBLISHER [East-West Environment and Policy Institute, East-West Center,
Honolulu, Hawaii, USA]

ABSTRACT:

The regional aspects of the marine environment have been slow to be recognized and used; marine regionalism to date has been oriented more towards specific issues than towards discrete regional areas. Typical of the Southeast Asian Seas area is the South China Sea. It is semi-enclosed by mostly small, physically adjacent, developing countries, and much of the sea is claimed by more than one country.

Marine regionalism in the context of the Southeast Asian Sea areas, can be traced by looking at the geographical setting; the type of issues that might be addressed through regional action; the interests of the region's relevant "actions"; existing marine regional arrangements, and their impact on ocean use; and marine regional models. Activities having regional connotations in the Southeast Asian Seas area, are among others, fisheries conservation and management, pollution control and abatement, shipping, data acquisition and storage and law enforcement. The relevant parties for regional action there include littoral states, countries outside the area, international agencies and private companies.

Certain generalizations about the interests of some relevant parties as to marine regionalism can be made. Interests range from support for action, reaction with regards to issues to active oppositions. Most countries of the area now do not seem prepared to make strong commitments to meaningful regional arrangements for marine-related activities.

Existing marine regional arrangements in the Southeast Asian Seas area, can be analyzed according to 5 elements: structure, objectives, functions and powers, processes and programs. The most important impact of existing marine regional arrangements maybe the gradual developing of a network of organizations, and people who will be able to respond positively to stimuli for more marine-related regional actions. It would be wrong to imply, however, that what the Southeast Asian Seas area needs is more marine regional systems or greater integrations of functions among existing agencies. Although the benefits from such processes maybe obvious, the international structure now may not be able to support them.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Alix, J.G.]

TITLE [The status of fishery economics research and statistics]

SOURCE [PCARR Fisheries Research Congress, Legaspi City., Aquaculture Research
Papers., Los Banos., 1975., p. 110-118]

ABSTRACT:

A status report was presented. Available resources were reviewed, and research progress described and evaluated. Specifically, problems were identified and research needs and priority areas were listed. A lists of proposed areas were also presented.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Arce, R.G.]

TITLE [Rice-fish culture farming system]

SOURCE [Farm management notes for Asia and the Far East, No. 9., 1986., pp. 31-41]

ABSTRACT:

A review is presented of rice-fish culture farming systems with respect to experience in the Philippines. Production economics are examined and fish culture in backyard fishponds are also considered.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Asian Institute of Aquaculture]

TITLE [National Workshop on Aquaculture Development Strategies]

SOURCE [1978., 213 p.]

PUBLISHER [Asian Institute of Aquaculture - Southeast Asian Fisheries Development Center., Tropical Palace, Metro Manila

ABSTRACT:

These reports deal with the status of fisheries (aquaculture, inland waters, and marine fisheries) in the Philippines with emphasis on manpower development, research, extension, , data base for planning and credit and problems encountered in these aspects as well as possible solutions.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Aspuria, T.G. and R.M. Fabro]

TITLE [A Socio-economic Survey of the Aquaculture Industry in Bicol]

SOURCE [Research Paper Series no. 20, 1979., 62 p.]

PUBLISHER [SEAFDEC-PCARR Research Program, Los Banos, Laguna]

ABSTRACT:

The aquaculture industry in Bicol region consists of fry business and fish farming. This study attempts to analyze the socio-economic status of fry gatherers and concessionnaires and the fishpond operators in the region. The specific objectives of the study are 1) to describe the social and economic conditions of fry gatherers, concessionnaires and fishpond operators in the region; 2) assess the cultural practices, and technology and estimate capital investments and costs and returns in fry gathering and fish farming; 3) analyze the pattern of fry gathering and distribution and patterns of stocking and cropping in fish farming; 4) measure production input requirements in fry business and fish farming; 5) study the relationships between fry gatherers and concessionnaires and pond owners and caretakers.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Baliao, P.D., Franco, N.M., Agbayani, R.F.]

TITLE [The economics of retarding milkfish growth for fingerling production in brackishwater ponds]

SOURCE [Aquaculture, Vol. 1 62, No. 3-4., 1987., pp. 195-205]

ABSTRACT:

Two experiments were conducted to measure the economic viability of retarding milkfish (chanos-chanos) growth (stunting) in brackishwater ponds. In the first experiment, two-month old fish were reared for 6 months in ponds with initial stocking densities of 15, 20, 25 and 30 fish/meter sq.. The second experiment, had a common stocking density of 20 fish/meter sq. with rearing periods of 6, 9, and 12 months. All experiments followed the lab-lab method of growing natural food plus additional substrates. Supplemental feeding using rice bran mixed with ground trash fish started 60 days after initial stocking period. Under Philippine conditions, stunting fish fingerlings at 20 fish/meter sq. for 6-9 months is most cost-effective; this permits the production of milkfish fingerlings for lower costs than they can be purchased.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Banasihan, A.L., E.R. Pamulaklakin and T.G. Aspuria]

TITLE [A Socio-economic study of carp culture]

SOURCE [Research Paper Series No. 26]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

An average carp operator was male, aged 49 years and had 9 years of schooling. The operators spent 1.68 months in the fishpond, 9.36 months in other occupation and were idle for 0.96 months. Sixty one per cent of the

operators were also rice farmers, 21% were employed, 15% were engaged in business and a few (3%) went to fishing. On the average, the operators derived P5,173 from other occupations. Carp pond operator's household on the average consisted of about 6 members.

Pond preparation was about two weeks on the average. Operators used both inorganic and organic fertilizers and supplementary feeds.

By region, production per hectare was highest in Cagayan Valley and lowest in Central Luzon.

Operators received positive net earnings.

An average carp pond required approximately 32.3 man-days for all operations. By type of species cultured, monoculture carp farms required the least labor per farm, about 26 man-days less than polyculture farms.

Foremost problems besetting the carp operators are lack of capital, unavailability of land, lack of technical support and limited supply of fry. Because of these problems, most of the operators had no plans to expand their carp farms.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Baum, G.A. and J. Maynard]

TITLE [A Socio-economics Study on the rural fishing population of the Bayawan Municipality in connection with Municipal Fisheries Pilot Programs]

SOURCE [1976., 33 p. (SCS/76/WP 42)]

PUBLISHER [Manila-South China Sea Fisheries Programme]

SECTION [ENVIRONMENTAL CONCERNS]

AUTHOR [Beveridge, M.C.M.]

TITLE [Cage and pen fish farming: carrying capacity models and environmental impact]

SOURCE [FAO Fisheries Technical Paper, (255)., 1984., 131 p.]

ABSTRACT:

The use of cages and pens to rear fish in inland waters is an increasingly popular method of fish culture, involving relatively low initial costs, and simple technology and management methods. However, these water-based culture methods differ from land-based operations such as ponds and raceways in that they are open systems, where interaction between the fish culture unit and the immediate environment can take place with few restrictions, and they are often sited in publicly-owned multi-purpose waterbodies. Thus any impacts may lead to a conflict of interests. A number of studies have demonstrated that the cage and pen structures can affect the multi-purpose nature of water bodies, by restricting space which might otherwise be used for fisheries, recreation or navigation, and by interfering with currents and sediment transport. In some

circumstances, predators and disease-bearing organisms have been introduced or attracted to the site. However, the most significant impacts are due to the method of culture employed. Intensive operations can affect water quality, and influence the biomass and diversity of the benthos, plankton and nekton. It is argued that the P loadings to the environment are the most important components of the wastes. The role of P in the diets of fishes is reviewed, total P loadings are quantified for both intensive tilapia and trout culture operations, and like P loading models developed by Dillon and Rigler (1974) adapted to predict the environmental impact of intensive cage culture on the aquatic environment. Tentative development limits are also proposed.

Following a review of current information on energy transfer from plant to herbivorous fish in ponds and lakes, efficiencies of 1.0-3.5% plant carbon; fish carbon are suggested as attained from extensive cage or pen culture. This is considerably higher than yields from lentic bodies managed for fisheries. The efficiency of transfer will vary with productivity, and the relationship between primary production and fish yield is likely to be sigmoid, as suggested by Liang et al. (1981) for fisheries yields. The models proposed for use in predicting the environmental impact of cage and pen culture are in the initial stages of development and have yet to be validated and calibrated. Several methods are proposed, and those include combining with extensive operations. Finally, it is proposed that some categories of water body may be unsuitable for large-scale culture operations.

SECTION [ECONOMIC APPRAISAL]

AUTHOR [Blanco, G.J.]

TITLE [Economic trends of Coastal Aquaculture in the Philippines]

SOURCE [Coastal Aquaculture in the Indo-Pacific Region; papers presented at the Indo-Pacific Fisheries Council Symposium on Coastal Aquaculture, Bangkok, Thailand, 18-21 November 1970 (ed. T.V.R. Pillay), West Nyfleet, England. Fishing Newsbook., 1972., p. 490-497]

ABSTRACT:

The economic aspects of finfish, shellfish and sea weeds farming in the coastal zones of the Philippines including levels of capital investments, costs of operation of different types of coastal aquaculture, cost-benefit ratios of each method compared to agriculture and present status of development, are discussed. The data indicate that there are sometimes more benefits derived from fish farming, than from agriculture. Investment return ratio is also comparatively high in coastal aquaculture practices.

SECTION [ECONOMIC APPRAISAL]

AUTHOR [Bravo, S.]

TITLE [Study of the Bangus Industry Prospects and Problems, Benefit/Cost

Analysis Approach)

SOURCE [Paper submitted to the U.P. Program in Development Economics, 1976]

ABSTRACT:

The study approved the profitability and prospects of the bangus farming industry. A 50 hectare bangus pond in Mindoro was used as a basis for economic assessment.

The project proved to be profitable, as shown by the positive Net Present Values and IRR of 47%.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Carandang, F.L. and L.B. Darrah]

TITLE [Bangus Production Costs]

SOURCE [1975., 18 P.]

PUBLISHER [Special Studies Division, Department of Agriculture., Diliman, Quezon City]

ABSTRACT:

The different costs of milkfish production for 1972 and a summary of costs and returns are presented.

SECTION [ENVIRONMENTAL CONCERNS]

AUTHOR [Chiu, Y.N.]

TITLE [Considerations for planning farm projects, p. 7-10]

SOURCE [Technical Considerations for the management and operation of intensive prawn farms (eds. Y.N. Chiu, L.M. Santos and R.O. Juliano)., 1988]

PUBLISHER [U.P. Aquaculture Society, Iloilo City, Philippines]

ABSTRACT:

The profitability of a prawn farm investment largely depends on the average weight of the harvest and on production. Investors generally want to attain the maximum possible production but face limitations which result in poorer growth and greater incidence of diseases. Typical limiting factors include lack of capital, limited water supply of unsuitable quality and poor soil quality oftentimes due to acid-sulfate conditions. Maximum profit can be attained when production targets and the pond design and facilities are planned with proper consideration for these factors.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Chong, Kee-Chai]

TITLE [Philippine Milkfish Production Economics Study Underway]

SOURCE [ICLARM Newsletter, Vol. 3, No. 1., 1980., pp. 6-13]

ABSTRACT:

The main purpose of the study is to collect information on the input-output relationships in milkfish Chanos-Chanos production in the Philippines. The data (analysis of which will be complete in mid-1980) can then be used to improve production operations.

SECTION [ECONOMIC APPRAISAL]

AUTHOR [Concepcion, E.R.]

TITLE [A Comparative Economic Analysis of a Freshwater Fish Culture Methods: the Fishpen and Fish Cage]

SOURCE [Undergraduate Thesis, University of the Philippines School of Economics, Diliman, Quezon City, 1982]

ABSTRACT:

Presents an economic appraisal of 2 freshwater fish culture methods - namely the fishpen and fish cage, with the town of Cardona, Rizal as the location of the study.

Based on the range of initial capital requirements and the project sizes, and on the investment criteria (NPV, IRR) applied in the evaluations, results show that the fish cage is superior to the fishpen.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Cresencia, J.R., A.M. Valiente and F.L. Carandang]

TITLE [Bangus Marketing]

SOURCE [1973]

PUBLISHER [Special Studies Division., Department of Agriculture, Diliman, Quezon City]

ABSTRACT:

A detailed description of the marketing proceeding followed by producers and middlemen. Computation of marketing margins, illustration of geographic flow of bangus and problems of marketing and suggested solutions.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Dela Cruz, Z.S., F.L. Bungcayao, L.N. Cea]

TITLE [Shrimp and prawn production and distribution in Camarines Sur]

SOURCE [Agricultural Marketing Report VII(6), 1985., 98 p.]

PUBLISHER [BAECON]

ABSTRACT:

Inland fisheries in Camarines Sur has shrimp as an incidental product. In contrast, trawlers had prawn as secondary catch. Pick-up method of selling was prevalent at the producers level and trading was generally characterized by payment on cash basis. Prices were determined by size and prevailing market price. Producers had weak bargaining power but were aware of prevailing market price. Both shrimp and prawn trading were dominated by wholesalers. Buyers of the producers included brokers, exporters, wholesalers, wholesalers-retailers and retailers. Transaction between buyers are also noted. Positive net return were noted among producers of prawn and shrimp. Marketing cost of fishpond operators average P 1.39 for shrimp and P 0.50 for prawn per kg. For trawlers, cost averages P 1.08 (shrimp) and P 0.99 (prawn). At the traders level, marketing costs per kg. of wholesalers averaged the highest at P 2.15.

Wholesaler-retailers spent an average of P 0.01 per kg. Inadequate financial resources, inavailability of technologies and inadequate transportation and storage facilities were cited as problems.

Government must give proper technical and financial assistance to the sector. Moreover, construction and improvement of roads to facilitate easy transport of inputs and products is also recommended. Government and private sectors are urged to work together in improving the quality of prawn fry.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Dela Cruz, C.]

TITLE [Fishpen and Cage Culture. Development Project at Manila Bay]

SOURCE [1982., 27 p.]

PUBLISHER [Manila, South China Sea Fisheries Program]

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Delamendo, M.N., Delamendo, B.H.]

TITLE [Income generation from small-holder fish farms]

SOURCE [INFOSIH Marketing Digest, No. 4., 1987., pp. 32-34]

ABSTRACT:

Small-scale aquaculture practices in the Philippines are examined.

considering in particular freshwater and brackishwater pond culture and costs and returns. A brief account is given of a polyculture project in Indonesia regarding *Cyprinus carpio*, *Oreochromis niloticus* and *Helostoma Temminckii* culture in freshwater ponds in Gurung Jaya.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Duaso, M.B., M.M. Viola, L.M. Hernandez, I.G. Tadas and R.A. Beronio]
 TITLE [Comparative analysis of fertilizer users and non-users in Brackishwater fishfarms, Philippines, 1982]
 SOURCE [Economics Research Report, No. 7., 1986., 34 p.]
 PUBLISHER [BAECON]
 ABSTRACT:

A multi-staged sampling scheme generated 720 sample fishfarms from 20 provinces, divided into 459 fertilizer users and 261 non-fertilizer users. The samples consisted of 475 monoculture fishfarms (334 fertilizer users and 141 non-fertilizer users) and 245 polyculture fishfarms (125 fertilizer users and 120 non-fertilizer users). The actual survey was conducted from May 22 to June 8, 1983, with all information collected referring to operations of fishfarms from January 1 to December 31, 1982. Results show that monoculture and polyculture fishfarms which used fertilizer generated more profits than non-users. Although usage of organic and inorganic fertilizers entailed additional costs, returns were also substantial.

In monoculture fishfarms, fertilizer users spent an additional P 391.34 per hectare but generated relatively higher income than the non-users per hectare. In other words, a peso additional investment in fertilizer generated around P 5.00 more in net profits. In polyculture fishfarms, fertilizer users incurred additional expenses of P 272.93 per hectare but generated P 1,087.64 more in net returns per hectare. A peso additional investment in fertilizer among polyculture fishpond operators yielded an additional return of around P 4.00 per hectare. There are other factors attributed to the increase in net returns in monoculture and polyculture fishfarms. These factors were years of experience in fishfarms operations, educational attainment, tenurial status, stocking rate, etc. The above conclusions should, however, be adopted with considerations of these other factors. The comparative analysis is purely descriptive and employs weighted average values in lieu of sophisticated inferences.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [FAO, Inland Water Resources and Aquaculture Service, Fishery Resources and Environment Division]
 TITLE [A study of methodologies for forecasting aquaculture development]
 SOURCE [FAO Fisheries Technical Paper, (248)., 1984., 47 p.]

ABSTRACT:

Growth in the production through aquaculture between 1975 and 1980 has been substantial but varying from country to country and product to product. This paper addresses the problem of analyzing the causes (1) to predict future growth, and (2) to better understand how a rapid and rational growth of aquaculture industries can be promoted nationally, regionally and globally. The study concludes that the data currently available to FAO are quite inadequate, as yet, to make the required analyses. It nevertheless demonstrates that useful indications can be obtained even from the information presently available, and, elaborates several approaches that could be usefully applied as soon as better data are available. The report calls attention to the utility of comparing changes in aquaculture to both the capture fisheries and agriculture in analyzing local, national and regional differences. Noting the markedly different levels of production among countries in relation to a variety of commonly employed indicators of agricultural resources, and corresponding differences in the problems of encouraging growth at different levels of intensity, production, the authors define and contrast Aquaculture Developed Countries and Aquaculture Developing Countries. The resulting classification cuts across the more general Developing/Developed Country contrast. Finally, a method is explored for assessing the relative importance of constraining factors based on a relatively subjective "expert rating" system, and an indication given of how a useful analytical model of trend analysis could be developed.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Fabro, R.M., and L.M. Lapie]

TITLE [A socio-economic survey of the aquaculture industry in the Ilocos Region]

SOURCE [Research Paper Series No. 11., 1978., 85 p.]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

The 3 components of the aquaculture industry in the Ilocos region are: fry business, fishpond operators and oyster culture. The most important species being handled by the fry gatherers and fish farmers is the milkfish. The study covers the: 1) characteristics and social conditions of different aquaculture businessmen and farmers in the region; 2) assess the technology followed in each of these businesses; 3) to determine production input requirements; 4) to determine and compare the costs and returns derived from the industry.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Fabro, R.M. and A.R. Librero]

TITLE [A socio-economic study of mudfish culture]

SOURCE [Research Paper Series No. 24., 1979]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

Mudfish or rice-paddy fish which is locally known as dalag (*Ophicephalus striatus*) is a labyrinthine fish which lives only in freshwater and is confined entirely to tropical Asia and adjacent islands. The study assesses the : 1) characteristics and social conditions of mudfish pond operators, 2) assess the technology followed in each of these businesses, and 3) to determine and compare the costs and returns derived from the industry.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Floyd, J.M.]

TITLE [International Fish Trade of Southeast Asian Nations]

SOURCE [Research Report No. 16., 1984., pp. 66]

PUBLISHER [East-West Environment and Policy Institute, East-West Center, Honolulu, Hawaii]

ABSTRACT:

The growth of international trade in fish and fishery products in each of the ASEAN countries over the last decade has been dramatic. Exports have increased rapidly and export growth has outpaced that of developed countries. Total fish imports have also grown at a rapid pace, although not as fast as exports. This growth has reversed the trend toward fish trade deficits that existed prior to 1971 and has resulted in increasingly positive trade balance.

Tuna and shrimps are the most valuable exports from the region. There are also substantial exports of squid, cuttlefish, shellfish, and specialty products popular among Chinese populations in the region and in Japan. Frozen fish processing is the most highly developed sector of the export industry, but there are also increasing amounts of canned products exported.

The general pattern of fish trade in the ASEAN region corresponds with the general patterns of international fish trade between developed and developing countries. Most of the export trade from each of the ASEAN countries is destined for markets in developed countries. In trade between the ASEAN countries, and developed countries, there are far more exports than imports into the region. There is relatively little trade among the ASEAN countries or between the ASEAN countries and other developing countries.

SECTION [ENVIRONMENTAL CONCERN]

AUTHOR [Gatus, A.R.]

TITLE [The Milkfish Culture Industry in the Philippines and its Problems]

SOURCE [ASEAN Meeting of Experts on Aquaculture, Semarang, Indonesia., Technical report., 1977., pp. 89-97 (ASEAN '77/FA.Eg A/Dec WP.9)]

ABSTRACT:

A summary account of milkfish (*Chanos-chanos*) aquaculture methods development, etc., in the Philippines is presented. The present status of the industry is described, and the climatic and weather conditions affecting it noted.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Gonzales, E.R.]

TITLE [The Underlying Production Structures of the Milkfish (*Chanos-chanos* Forskal) Nursery Aquaculture Industry and its Demand for Factor Inputs: A Transcendental Logarithmic Cost Function Approach.]

SOURCE [M.Sc. Thesis, Asian Social Institute, Manila, Philippines., 1981.]

ABSTRACT:

The objective of the study is to determine the production structure of the milkfish nursery aquaculture industry and its demand for factor inputs in estimated equations. The production structure covers: economies of scale (SCE), marginal costs (MC), and the elasticities of substitution (AES). Demand for factor inputs pertains specifically to estimate demand equations, for milkfish fry, labor, and pond, and other variable inputs combined (feeds, fertilizer, and pesticides). The basic framework that was used to derive all of these is the Transcendental Logarithmic Costs Function or the Translog Cost Function.

The descriptive analysis of the study showed that a single nursery farm is producing an average of 7,998,444 pcs. of culture milkfish fingerling per year. This average output level requires an average input of 11,673,583 pcs. of fry, 242 mandays of labor and around 10.6 hectares of nursery ponds. The average prices of these inputs are: P 0.1007 for fry, P. 13.29 per manday of labor and an annual rent of P 2,784.58 per hectare of nursery ponds.

The systematic regressions of translog was done by using (3) econometric models; Cobb Douglas, Unconstrained and Separable production functions. By using the F-tests statistics, it was determined that the unconstrained function was the most appropriate. The sq. and the t-ratios have indicated that 2EF is the best method.

Results showed that the marginal cost of the industry is equivalent to 9.68 and the economies of scale is already negative (-2.24). The analysis of the average cost showed that the cost of production is minimized at pt. Q indicating (16) to (40) hectares of nursery ponds as the ideal economic size barring other factors, ecological, political, geographical, etc.

The AES of the industry use, 0.96 for fry to feeds + fertilizer + pesticides; 0.90 labor to other variable input. The significance of this structure to the employment of rural labor is high and can be made operational by providing training programs in aquaculture at the grassroots levels.

By partial differentiation of the translog cost function, the demand for factor inputs were identified. For instance, the estimated additional demand for fry is 9.6 million pcs., 341,469.85 mandays for labor, 199.66 hectares of n-ponds and 17,378 bags of the feeds, fertilizers and pesticides combined. The four demand equations for fry, labor, ponds and F-F-P inputs can be useful tool to plan an integrated development of the industry.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Gonzales, E.R.]

TITLE [A Socio-economic geography of Resource-use conflict at Laguna Lake, Philippines. Seminar on "Policy issues in Philippine Fishery -Resource based Development ,UST Graduate School - 18 Oct 1988]

SOURCE [1988., 54 p.]

PUBLISHER [Philippine Institute for Development Studies]

ABSTRACT:

This is a synopsis of the Cambridge research manuscript (Gonzales, 1987) on the problems of resource-use conflict of the Laguna Lake resources. The conflict emanates from the conflicting goals of fisheries and agricultural use vis-vis the use of the household sectors for drinking water and flood control basin. The focus of the study is the subsequent displacement of the fishing villages at Laguna Lake as indicated from the worsening levels of their household income. From an estimated baseline of P13,480 annually in 1963-64 this level decreased to P10,000 and P4,149.83 in 1982 at Limbon Limbon.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Gonzales, E.R.]

TITLE [A socio-economic geography of the Laguna Lake Resources 1961-85) and its implications to Aquatic Resources Management and Development in the Philippine Islands]

SOURCE [1987., 67 p.]

PUBLISHER [Department of Geography, University of Cambridge]

ABSTRACT:

This research focuses on the protracted socio-economic crisis at the Laguna Lake, covering the traditional fishing villages. As the rhetoric of some cause-oriented groups picks up and rides on these unsolved issues ever since the early 1980's, there were no substantive research documents that attest to the veracity of this socio-economic claim. Thus, this study of this socio-economic problems was designed to scientifically verify these socio-economic allegations. Moreover, this study was expounded to cover other related factors that can open up clues to other interrelated problems that bear weight on some of the more serious national problems along the line of economic development for our islands and the entire archipelago.

The general objectives of this research is to conduct a time series study of the socio-economic geography of resource use at Laguna Lake and its implications to aquatic resource management and development. The more specific objectives under this regard are as follows: identify the overall trends of Laguna Lake Fisheries from 1961-1984/85; to estimate the time series trends of the entire fishpen industry from 1974-1984/85; to study the implications of these socio-economic results to problems of resource use contradictions at Laguna Lake in terms of: intra-sectoral conflicts within the fisheries sectors; inter-sectoral conflicts between the fisheries and the agricultural sectors; and the multi-sectoral conflicts between fisheries and the household sectors

vis-a-vis the agricultural sectors; and, lastly, to study the implications of results to aquatic resources, as the "premium mobile" factor towards new dimension of economic development for the Philippine Islands.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Gonzales, E.R.]
 TITLE [Small-scale Tilapia Cage Technology adopted in Fishing Villages in Laguna Lake, Philippines]
 SOURCE [Aquaculture 41., 1984., p. 161-169]
 PUBLISHER [Elsevier Publishers, Netherlands]
 ABSTRACTS:
 A small-scale tilapia cage project was tested in two fishing villages in Laguna Lake, Philippines. The results showed that household incomes of participating families increased from P6,183 to P41,768 per year, and household savings from about zero, to P71.02 per day. Participating families consequently purchased gear for sustenance fishing, and luxury goods for their household.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Gonzales, E.R. and D.G. Webb]
 TITLE [The Business prospects of aquaculture in the Philippines: the case of the bighead carp (A. Nobilis) aquaculture and processing]
 SOURCE [Aquaculture - A Biotechnology in Progress (ed. De Pano, et. al.), 1989]
 PUBLISHER [European Aquaculture Society, Bredene, Belgium]
 ABSTRACT:
 The prospects of aquaculture business in the Philippines are bright. Bighead carp (A. Nobilis) has an estimated profit of U.S. \$1.4 million, U.S. \$0.14 million operating costs, and estimated gross revenues of U.S. \$1.5 million from sales. Plans were formulated to manufacture livestock feed appetizers from left-over fish bones, fish fillet-meat extenders from fish muscle, and liquified hormonal fertilizers from fish organs. The other aqua-ventures are: sea-farming of mussels, prawns and shrimps with milkfish and financial and economic indicators, as well as prevailing geographical and institutional factors. The Philippine Archipelago is rapidly becoming the spin-off points of the aquaculture revolution in the developing tropical world.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Guerpero, R.D., III]

TITLE [Culture of male Tilapia Mossambica produced through artificial sex reversal]

SOURCE [Advances in Aquaculture. Papers presented at the FAO Technical Conference on Aquaculture., Kyoto, Japan, 26 May - June 1978. (eds. T.V.R. Pillay and W.A. Dill. Farnham), Survey (U.K.) Fishing News Book., 1979., pp. 166-168., 2 tables, 4 refs.]

ABSTRACT:

Experiments were conducted to compare production and reproduction of methyltestosterone-treated and untreated fish at different stocking rates in fertilized ponds, determine the effectiveness of methyltestosterone fed at varying durations for inducing sex reversal of sexually undifferentiated fry, and determine the costs of sex reversal treatment. Fry of Tilapia Mossambica were treated with 30 UG. of methyltestosterone per gramme feed in concrete tanks for 2, 3 and 4 weeks. Control fish were stocked in 0.1 ha. ponds at 10,000/ha and 20,000/ha while treated fish were stocked at 10,000/ha., 15,200/ha., 20,000/ha., and 30,000/ha.. Higher standing crops and larger individual weights were attained with treated fish compared with untreated fish at comparable stocking rates. Hormone treatment for 2, 3, and 4 weeks produced 69.93 and 98 per cent males, respectively. Control fish reproduce at a greater rate than the treated fish. The cost for feed, solvent and hormones needed to treat 1,000 fishes for 4 weeks was US \$0.84.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Guerrero, C.V. et.al.]

TITLE [Bangus: A Look Ahead]

SOURCE [1974., 13 p.]

PUBLISHER [Marketing Research Unit, NFAC, DANR., Diliman, Quezon City]

ABSTRACT:

This paper projected the population, bangus consumption and surplus from 1975 to 1980. Population was assumed to grow by 3.1% per year; bangus production was assumed to increase at (3) different rates of output per hectare of fishponds, and per capita, consumption was projected on 3 different output bases. Under these conditions, a surplus (the difference between bangus production and consumption of fresh and frozen bangus) will only be realized if the high outputs estimate can be attained. The surplus was projected to total 7,120 tons in 1978, 47,530 tons in 1979, and 52,200 tons in 1980.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Guerrero, C.V. and L.B. Darrah]

TITLE [Bangus Production Cost by Type of Climate]

SOURCE [1974., 21 p.]

PUBLISHER [Special Studies Division, Department of Agriculture., Diliman, Quezon City]

ABSTRACT:

Type I farms had the highest average gross sales of P92,928. Expense totalled P67,000 leaving a net return of P25,728 per farm which is equivalent to P1,249 per hectare of rearing ponds, or P1.07 per kilo of bangus sold (prior to marketing costs).

Type II farms had an average gross income of P32,775 and incurred expenses amounting to P29,223. The average net income was P3,542 equal to P182 per hectare of rearing ponds or P0.43 per kilo of bangus sold (prior to marketing costs).

Type IV farms had an average gross income of P42,307 and expenses of P32,107. This gave a net return of P9,200 equal to P258 per hectare of rearing pond of P0.79 per kilo of bangus sold (prior to marketing costs).

The high return obtained by Type I farm was due to their getting 2 and 3 crops per year (versus 1 or 2 farms) and use of improved management practices.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Guzman, R.O., R.D. Torres, and L.B. Darrah]

TITLE [The impact of Bangus landings from Laguna Lake (Rizal Points) on Bangus prices in Malabon]

SOURCE [1974., 11 p.]

PUBLISHER [Market Research Unit, NFAC, DENR., Diliman, Quezon City]

ABSTRACT:

In connection with urgent problems relating to the depressing effect on prices of added fish catch from Laguna Lake, a study was undertaken determining the quantity of Bangus landings at major points along the Rizal side and quantity shipped to various destinations.

During the period of the study, more than 1,080 tons of bangus were landed at the (5) major stations along Laguna Lake in Rizal with 2 major landing points (Patumhay and Looc) providing a total of more than 80% of the total quantity landed. Quezon City and Pangasinan were the principal destinations absorbing more than 370 and 212 tons, respectively over the (3) months period.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Lampe, Harlan]

TITLE [Social Science Research and Education Needs of Fisheries in Southeast Asia]

SOURCE [1976]

PUBLISHER [Agricultural Development Council (Singapore Office).. New York, USA]

ABSTRACT:

The paper discusses on the need of fisheries in Southeast Asia to attain a level where development can be sustained. In order to promote this level of fishery development, there is an urgent need for social science research and education.

Request for original copy of the paper can be sent to:

Gerard Rixhon

Coordinator: Regional Research and Training Program

133 Sukhumvit 21, Bangkok 10110

Thailand

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Lapie, L.P. and T.G. Aspuria]

TITLE [A Socio-economic Survey of the Aquaculture Industry in Mindanao]

SOURCE [Research Paper Series No. 17., 1979., 122 p.]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

The objectives of the study are: 1) to describe the socio-economic conditions surrounding the fry gatherers, concessionnaires, dealers and rearing pond operators in the area; 2) to assess the cultural and management practices; 3) to estimate the capital investment, costs and returns of fish farming, fry gathering and marketing; 4) to analyze the pattern of fry gathering and marketing; 5) to measure the labor requirements in the fry business and fishpond operating, and 6) to study the relationship between fry gatherers and concessionnaires and between pond owners and caretakers, and 7) to study the market structure of the aquaculture industry in the area.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Lapie, L.P. and Librero, A.R.]

TITLE [Crab farming in the Philippines: A Socio-economic Study]

SOURCE [Research Paper Series No. 21, 1979., 56 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

situation, unfavorable price structure, insufficiency of operating capital, lack of proper infrastructure, unpredictability of weather and unavailability of technical support.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R., et.al.]

TITLE [Awareness and Sources of Aquaculture

SOURCE [Research Paper Series No. 28., 1979, 35 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

The study covered 430 fishpond operators from Ilocos, Central Luzon, Southern Luzon and Bicol. Of the total sample farms, 78% were milkfish monoculture and 12% were bangos in combination with other species such as prawn and crab.

Available cultural and technological practices in fish-farming consisted of pond preparation from pond fallowing, drying, levelling, cleaning, pest control, fertilization, growing of feeds and other management operations such as water management, type and rate of stocking, supplementary feeding and cropping. The technologies for various operations were either developed by the fish farmers themselves through trial and error process or have been generated by research institutions here and abroad.

Most of the operators were not aware of some of the technicalities and required practices in aquaculture. The major sources of information were fellow farm operators. About one-third of the operators have been in contact mostly with the technicians of the BFAR by means of farm visits, seminars and meetings averaging 1 to 5 times a year. Aside from these, few of them are members of fish farmers organizations where they obtain such benefits as exchange of ideas, security, up to date fish farm technology and information on the price of products.

Almost half of the respondents were receptive to technological innovations and considered themselves as well as their community as faster or among the first in adopting these innovations.

Respondents considered the high costs of inputs as the major source of problems.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R.]

TITLE [Resources productivity in milkfish culture in the Philippines., P. 11-29]

SOURCE [Economics of Aquaculture, Seafishing and Coastal Resource Use in Asia.

Proceedings of the Second Biennial Meeting of the Aric. Econ. Society of

ABSTRACT:

This study is part of the research program entitled "A Socio-economic Survey of the Aquaculture Industry in the Philippines". The study covers seven regions throughout the country namely: Ilocos, Cagayan Valley, Central Luzon, Southern Luzon, Bicol, Western Visayas, and Western Mindanao. A total of 61 crab farm owners/caretakers were personally interviewed.

It was conducted to study the economic aspects of crab culture as well as the social conditions of the crab farm operators. Specifically, the objectives are: (1) to study the characteristics and social conditions of the crab farm operators, (2) to assess the practices and technology followed in crab culture, (3) to determine the patterns of input use in crab culture, (4) to analyze the costs and returns in crab production, (5) to assess the problems and plans of crab farm operators.

On the average, 37% of the sample farms was owned while a much higher percentage (61%) was leased. Majority (82%) of crab farms were operated as a single proprietorship.

Almost all of the respondents (98%) of the operators had received formal education.

Some of the reasons given by operators for venturing into the fishpond business included its being the main source of livelihood in the area, line of specialization and good/additional source of income.

Duration of pond preparation in crab farms ranged from 16 days in Luzon to 31 days in Visayas/Mindanao. In general, farms were repaired only when needed. Pond cleaning, levelling and pond drying were done in majority of the farms.

Only 46% of the farms applied fertilizer either organic or inorganic.

Forty nine out of the 61 crab farms purchased crab seeds, in most cases (46%) from other towns but within the provincial location of the pond. On the average, 48% of the operators acclimatized their stock for 9.5 hours.

Most farms stocked crab in May. The largest volume of fry was stocked in August averaging 12.18 thousand pieces. On the average, piece of crab seed as P149 per thousand.

Only 19 out of the 61 crab farm operators supplemented the natural food in the pond with the practice being more predominant in Luzon. Rice bran was the most widely used supplementary feeds.

A monoculture crab farm produced a total of 2801 or 339 kilos per hectare. Productivity in combination farms was higher averaging 698 kilos. Productivity per hectare of pure crab farm was highest in Bicol and lowest in Luzon. In crab polyculture on the other hand, productivity was lowest in Visayas/Mindanao and highest in Luzon. A higher yield per farm and per hectare was obtained by large farm operators than the small farmers.

Most farms reported to have cropped in December. Highest price was received in February while the lowest in August. Average price is P7.63 per kilo. The big proportion of capital investment went to land (94%), while the remaining percentage went to farm buildings and transportation.

On the average, a crab farm received a total income of P56,878. Gross receipts realized per hectare and per farm was bigger in crab polyculture (particularly crab-milkfish-prawn) than in crab monoculture. The annual gross income per hectare was higher in large farms than in small farms. Although expenditures incurred per farm was higher in large farms than in small farms, the expenses were slightly lower in the former on a per hectare basis.

A direct relationship existed between the number of man-days utilized per operation and the size of farm.

Major problems encountered in the fishpond industry as cited by farm operators include unavailability of supply of inputs, peace and order

Southeast Asia, 3-6 Nov. 1977, Tigbauan, Iloilo, Philippines (eds. A.R. Librero and W.L. Collier., 1979., 384 p.)

PUBLISHER [Agriculture Dev. Council and PCARR]

ABSTRACT:

The paper attempts to 1) assess the present technology in milkfish farms in the Philippines, 2) analyze resource productivity for various types of management, and 3) estimate costs and returns in producing milkfish.

Data were based on a survey of 1,175 sample bangus pond operators/caretakers covering 526 barrios from 40 provinces throughout the Philippines. The largest regional sample was taken from Central Luzon which comprised 28% of the total.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R., A.M. Nazareno and E.S. Nicolas]

TITLE [A Socio-economic Survey of the Aquaculture Industry in Western Visayas]

SOURCE [Research Paper Series No. 15., 1979, 85 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

The study aims to provide a profile of the aquaculture industry in the region as well as the socio-economic conditions of fish farmers and related population such as fry gatherers and distributors. In addition, this study attempts to evaluate the existing cultural and management practices in the aquaculture industry of the region.

A total of 294 respondents were personally interviewed, 43 of whom were fry gatherers, 15 fry concessionnaires, 226 were fishpond operators, and 10 were engaged in oyster farming.

Each industry (fish fry, fish pond and oyster farming) was discussed separately. Production, marketing, income and socio-economic aspects were taken into consideration in each type of industry.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R., E.S. Nicolas, E.O. Vasquez and A.M. Nazareno.]

TITLE [An assessment of the Fishpond technology and management in the production of milkfish (bangos) in the Philippines]

SOURCE [Research Paper Series No. 4., 1976, 143 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

The aquaculture industry in the Philippines is dominated by the culture of bangos which provides employment to an estimated 150,000 workers. Accordingly, bangos constitute approximately 15 per cent of Philippine fish consumption. This study was then conducted mainly to describe the cultural and

management practices presently used in milkfish ponds in the country. The productivity rates for various cultural practices and factors such as type of farm ownership and size of farm are also discussed.

A survey of 1,175 bangos fishponds was conducted covering 40 provinces, 156 municipalities, and 526 barrios in the Philippines. Out of 1,175 sample fishponds, 787 are owners and 388 are caretakers.

95% of the operators were male. The average age of owners was 52 years while caretakers were 6 years younger. Majority of the operators received formal education. The average number of years in schooling was directly proportional with the size of the farm ranging from 8.1 years in small farms of one hectare and below to 11.7 years in large farms of 50 hectares or more.

In general, pond owners and caretakers were economically active throughout the year spending 4 months in other occupations. They were not gainfully employed for one month. It seemed that the desire to take other employment appeared to be inversely related with the size of farm since a greater proportion of small farm operators engaged in other occupation. Conversely, big farm operators were less prone to occupy themselves with other occupations. The two most popular occupations were business and farming for owners and fishing and business for caretakers.

General pond repair, cleaning, drying and levelling of pond bottom are among the various aspects of pond preparation. These activities took about four weeks per pond. The chemical method was the most preferred method of eradicating pests, followed by catch and kill method. The proportion of chemical users and those employing the catch and kill method increased with farm size.

Two-thirds of the respondents used organic and inorganic fertilizers. Small operators prefer to use inorganic fertilizers while big farms preferred both types. Organic fertilizers commonly used were chicken and animal manures. Among the inorganic fertilizers used the nitrogenous fertilizers were more preferred. Generally, only one type was used.

To determine the sufficiency of natural food in the pond, majority of the operators used the ocular method. Where natural food is insufficient, supplementary feeding is practiced. Sources of supplements were usually located within the barrios or municipalities where the pond are located.

In the Philippines, 78% of the fishponds used fry for stocking than fingerlings. Cagayan Valley, Central and Eastern Visayas, Western and Southern Mindanao reported having all sample ponds stocked with fry. On the other hand, more farms in Central and Southern Luzon stocked fingerlings. These are the regions where many of the nursery ponds are located. It had been observed that purchasing and stocking of large quantities of stock good for several rearings was practiced in most regions. The idea of bull stocking is to take advantage of the abundance of fry/fingerlings at periods of low prices.

In general, bangos production per farm is directly related to the rearing area harvested. Also, fertilizer-using farms realized a much greater gain than non-users. Those applying both organic and inorganic types realized higher yields than those using only one type and those using inorganic fertilizers produced more than those using organic fertilizers.

Total harvesting of crop seemed to be the better method of harvesting compared with selective cropping.

A direct relationship existed between yields per farm and size of farm. On the other hand, yield per hectare was inversely related to farm size for farms five hectares and above. The highest yield per hectare was derived from farms with sizes of 5 to 10 hectares.

Only one-fourth of the sample operators reported having been reached by government technicians. One-half of those operators received information on

cultural practices particularly on the use of fertilizers, production and use of plankton, and improved care of fingerlings. Other were informed on the availability of fry at BFAR.

87% of the operators suggested that the fishpond industry need government assistance primarily on credit and secondly on the control of prices of inputs as well as output. Another aspect in which the government can assist the industry is the provision of technical support through fielding technicians and launching a government program geared at increased production.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R. et.al.]

TITLE [Fry gathering patterns, costs and returns, and socio-economic conditions of fry gatherers in the Philippines]

SOURCE [Research Paper Series No. 1., 1976]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

This document is published as part of the research program "A Socio-economic Survey of the Aquaculture Industry in the Philippines" jointly undertaken by the Southeast Asian Fisheries Development Center and the Philippine Council for Agricultural Resources Research. In this part of the study, 229 fry gatherers were personally interviewed in the (10) regions of the Philippines. Seventy-eight per cent of the fry gatherers were male, their average is 39 years of age, and their average educational attainment was 3 to 6 yrs.. Out of the (12) months, fry gatherers spent (3) months in fry gathering, and 6.3 months in other occupations. For about 2 to 6 months,, they were not gainfully employed. The study covered fry grounds in 34 provinces. By species, bangus fry was available in all the fry grounds; prawn in Ilocos, Southern Luzon, Rizal and Western Visayas; crabs in Southern Luzon and Bicol and Cagayan Valley. The most common collecting method was through the use of the sagap, than the sayod and the saplad. The fry gathering season varied by species. Little capital investments are required for fry gathering. The average capital inventory was P44 (range 10 to 81). Catching gear was the main capital expense.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R., et.al.]

TITLE [Seaweed farming in the Philippines: A Socio-economic Study]

SOURCE [Research Paper Series No. 27., 1979, 39 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

Twenty seaweed farmers were interviewed in Calawisan, Lapu-lapu City, 16 were monoculturing *Caulerpa* spp. in their ponds while 4 were polyculturing it

with bangus.

Monoculture ponds had an average area of 1.5 has. while polyculture farms were bigger, 4.06 has. 40% of which was devoted to seaweeds.

Of the 20 farmers interviewed, 16 were owners and 4 were caretakers with an average age of 47 years and had a formal schooling for 5 years.

The owner spent about 8 mo. in other occupation with only about a month spent in pond operation. The caretaker spent 7 months on other occupation and the rest of the year in the farms.

The average seaweed farm used up an equivalent 1.6 months of man's labor. Water management required the most number of man-days 28.6 or 52.8% of the requirement. About 40% of the requirement was provided by the owner while the caretaker contributed 23%.

Planting was scattered throughout the year except in November. May and June seemed to be the peak planting months. Model harvesting months were September and October. Monthly quantities harvested were high in the first six months and lower during the succeeding months. On a per ha. basis, annual production amounted to 3312 kg.. The quantity of seaweeds produced in monoculture ponds were slightly higher, 3312 kls. per ha. than in polyculture farms, 328.2 kls.. In addition to the seaweeds, the polyculture farms harvested 371 kls. per ha. of bangus. Investment per ha. was higher in monoculture ponds, P406, than in polyculture farms, P45.

A seaweed farm generated a gross income of P3667 in 1974, 94% of which was cash income. This was equivalent to P1825 per ha.. Cash expenditure amounted to P853 or 74% of total expense. Largest expense items were hired labor, equipment purchases and seedlings bought. Non-cash expenses amounted to P328 per farm, thus, total expenses was P1281 per farm or P637 per ha.. Net cash income generated was P2483 per farm or P1236 per ha.. Therefore, about P1.86 was earned by the operators in net profit for each peso he spent in operating his seaweed farm.

Problems cited include oil spillings from nearby refinery and barages, lack of capital or unavailability of credit, lack of technical assistance and source of seed stock.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R., A.R. Callo, P.S. Dizon, and E.R. Pamulaktakin]

TITLE [Oyster Seafarming in the Philippines: A Socio-economic Study]

SOURCE [Research Paper Series No. 6., 1976, 101 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

A total of 163 oyster farm operators were personally interviewed, 99 from Ilocos, 6 from Cagayan Valley, 48 from Southern Luzon, and 10 from Western Visayas.

All the farms were owner-operated and predominantly under sole proprietorship. Five per cent of the farms, however, were under partnership, found in Ilocos and Western Visayas.

An average oyster farm operator was a male, aged 43 years, and had 6.3 years of schooling. Ninety per cent of the operators attended school.

The operators on the average spend 9.4 months to other occupation. These occupations ranged from fishing to farming and employment in vocational jobs and generated an average annual income of P2,408.

The culture techniques adopted by the operators were stake, hanging, lattice, broadcasting, or a combination of these methods. The most common method was the stake; this was followed by hanging. The lattice combination with hanging was found only in Ilocos.

The decision to use a particular method depends on the perceived productive efficiency of the technique and the popularity in the area of the particular method.

Oyster culture depended greatly on bamboos, except for the case of broadcasting.

On the average, oysters were harvested 6.4 months after spat collection. Setting patterns appeared to be bi-modal, the low peak in May and the high in September-October. Oyster was available all year round from the bigger farms. In the smaller farms, though, harvesting was made only during one or two months of the year.

Oyster were sold either shelled or unshelled.

Oyster farmers receive positive net earnings. Only a small portion of the oyster farmers studied borrowed their operating capital mainly because of the lack of it or due to unexpected expenditures. The major sources of credit were non-institutional.

The major sources of farm labor were the operator and the family. However, as farms grew larger there was increasing dependence on hired labor caretaker labor.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R., et.al.]

TITLE [Case Studies of Milkfish Nursery Farms in the Philippines]

SOURCE [Research Paper Series No. 19]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

Studies on the economics of nursery pond culture are scanty. This study aims to (1) study the social conditions of the nursery pond operators; describe the cultural and management practice presently used in milkfish nursery farm and (3) estimate the costs and returns from milkfish nursery ponds.

Two samples were taken for every farm size. Farm sizes were classified as small, medium and large.

Pond preparation usually takes 2-6 weeks prior to stocking.

Supplementary feeding (rice bran and bread crumbs) were used by respondents.

Fingerlings cropped were sold in contract in large farms and by retail and wholesale in small and medium farms, respectively. Fingerlings were either sold picked-up from the fishpond or delivered to the buyers.

Capital investment in the nursery farm included the farm buildings, motorized and unmotorized bancas, nets, containers and other tools and equipment.

Positive net earnings were realized by the respondents.

Nursery farming is faced with such problems as lack of capital, unavailability of fry, water pollution, unavailability of fertilizer and other inputs, flood and poisoning of stock.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R. et. al.]

TITLE [Milkfish Farming in the Philippines: A Socio-economic Study]

SOURCE [Research Paper Series No. 8., 1977]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

As part of the project on socio-economics of the aquaculture industry in the Philippines, a survey was conducted of 1,175 sample bangus fishpond operators throughout the country. The sample covered 526 barrios from 156 municipalities in 40 provinces. Respondents were either the owner or the caretaker. This extensive report is based on the results of the survey, and is divided into major sections on the fishpond operators and his farm, cultural practices, stocking patterns, fishpond productivity, capital investments and costs and returns in milkfish production, marketing and prices, labor requirements, and labor relations, and social conditions of fish farmers and caretakers.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R. et.al.]

TITLE [Patterns of Fry Purchase and Sale in the Philippines: A study of fry concessionnaires and dealers]

SOURCE [Research Paper Series No. 3., 1976., 143 p.]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

This report is published as part of the program "A Socio-economic Survey of the Aquaculture Industry in the Philippines" jointly undertaken by the Southeast Asian Fisheries Development Center and the Philippine Council for Agricultural and Resource Research. This report presents information on the milkfish production industry. Some 1,175 fishponds were surveyed. Almost all operators were male, and had an average of 52 years old. Caretakers were on the average 46 years. Most of the operators had received formal education, 96% for owners and 89% for caretakers. The average number of schooling was directly proportional to the size of the farm, ranging from 6.1 years in small farms to 11.7 years in larger farms. In general, both the owners and caretakers were economically active throughout the year, spending a little more than 50% of their time in fishpond operations. About (4) months were spent in other occupations and for (2) months of the year, they were not gainfully employed. The desire to take other employment was inversely related to the size of the farms. Though the oldest of the farms dated back to 1908, the majority had begun since 1960. The average size of the farms varied among regions. The over all average for the Philippines was 13.39 has. Details were included of cultural practices.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Librero, A.R., et.al.]

TITLE [An economic analysis of the production of prawn in Luzon]

SOURCE [Research Paper Series no. 29., 1979, 67 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

One hundred four sample prawn farm operators from Ilocos, Southern Luzon and Bicol Region were personally interviewed of which 6 were culturing pure prawn, and the rest cultured combinations of milkfish and prawn; milkfish, prawn and crab; and prawn and crab.

Majority of the respondents were pond owners, about 53 years of age and had formal education.

Venturing in the fishpond business come about mainly because their land was suitable for fishfarming. For the caretakers, the main reason given was that they were hired by the owners.

Household size averaged 6 members with 1-2 economically active members averaging 34-30 years of age respectively.

Almost all of them practiced pond fallowing. Eradication of pests and predators require the use of chemicals such as the Endrin. Inorganic fertilizers were also used to enhance growth of natural food of the fish.

Seven methods of harvesting were employed by the operators, however, pond draining was the most commonly used method particularly in Bicol. Other methods used were the baklad and gill nets.

Users of fertilizers, chemicals and supplementary foods enjoyed higher production than non-users. Likewise, those practicing pond fallowing also received higher yields than those not practicing the same practices.

Capital investments include farm buildings, transportation and nets.

Almost all (99%) of the products were sold to the market either in wholesale or retail basis. Positive net earnings were realized by operators.

Problems of prawn farmers centered mainly on culture practices. High price, and unavailability of the input were the problems met by the operators for fertilizers, pesticides, and seeds. Other problems reported were poaching and cannibalism.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Lizarondo, M.S., M.Y. Maron, E.V. Javier]

TITLE [The production and distribution structure of the shrimp and prawn industry in Iloilo]

SOURCE [Agricultural Marketing Report VI(13)., 1984., 87 p.]

PUBLISHER [BAECON]

ABSTRACT:

Milkfish remained as the dominant species in Iloilo fishponds. Higher income from monoculture, with prawn getting 38% of income returns as compared with shrimp's 9%. In marketing, producers opted for delivery sale, most of which is in cash basis. Prawn and/or shrimp prices were primarily based on size. Transaction guided by the "first come, first served basis" and done mostly in

stalls on cash basis. The survey of prawn producers indicated a heavier degree of concentration on volume handled by supplier. Still other factors affect competition like; availability of supply from nearby provinces and presence of substitute fish species. Capital is a determining factor both for entrance and exit to the market. On the other hand, individual retailer shares (volume handled) were relatively small. Due to limited supply of prawn in local markets, wholesaler-retailer had a monopoly of this product. Producers identified 5 types of market outlets namely: wholesaler-retailer, brokers, wholesalers, retailers and exporters. The export market share 49% of the total marketed volume of prawn. In shrimp marketing, wholesaler-retailers garnered 51% of the total disposition. The most common linkage reported for shrimp involved 2 marketing intermediaries: producer---wholesaler-retailer---consumer and producer---broker---retailer---consumer. In prawn marketing, the common linkage was producer---wholesaler-retailer---consumer. Locally, most of the harvested shrimp goes to Iloilo. Abroad, biggest buyer is Japan. Cost of polyculture production was inversely related to size. Profitability found highest among pure prawn growers. Capital and supply pose problems to fish farmers.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Lizarondo, M.S. and C.N. Arancillo]

TITLE [Developing the prawn and shrimp industry in the Philippines:
Production and marketing relationships]

SOURCE [Agricultural Marketing Report VII(16).., 1985., 90 p.]

PUBLISHER [BAECON].

ABSTRACT:

The economic significance of prawn and shrimp in the Philippines is best manifested by their increasing share in the exports of fishing products. These species not only help improve the country's BOP position but they also provide the tax revenues to the government and serve as a source of livelihood. On top of these, prawn and shrimp are also important in the betterment of Filipino diet.

The development of the said products will therefore not only help meet the country's food requirements but also render beneficial effects on external economies of the nation. The findings of the study are as follows: 1) Milkfish production still dominated aquaculture production; 2) Prawn and shrimp industry purely competitive at certain levels of trading; 3) Marketing flow of prawn showed biggest share of production is brought through Manila through brokers and wholesalers. On the other hand, bulk of shrimp production is consumed in provinces involving 2-3 marketing chains; 4) Producers of pure prawn and of prawn. Shrimp and milkfish were better-off than the rest. They obtained the highest production returns and widest marketing margins. Analysis of traders' marketing costs and margins showed that to a certain extent, transportation was the primary determinant of expenses and margins; 5) Prawn and shrimp producers cited financing as one of the major problems. Other constraints included adverse weather, peace and order conditions, inadequate technologies and inputs, prices and poor marketing facilities; 6) Producers and traders engaged in prawn and shrimp businesses were mostly aware of the export and profit potentials of these species. More producers had intention of expanding operations. 7) Among fishpond

operators who were engaged in prawn and shrimp culture, singly or in combination with the other species, prawn proved to be the major income contributor.

The study concludes with a list of recommendations which include the following: 1) further development of prawn industry; 2) accurate and timely dissemination of information; 3) technological innovations; 4) actions to eliminate or lessen problems faced by fishpond operators; 5) road infrastructures and decrease in transportation cost.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Lizarondo, M.S., E.V. Javier, A.D. Lucido]

TITLE [The prospects for production and marketing growths of the shrimp and prawn industry in Camarines Norte]

SOURCE [Agricultural Marketing Report VII(9), 1985., 87 p.]

PUBLISHER [BAECON]

ABSTRACT:

The study showed prawn as the biggest earner among the fishpond species in Camarines Norte. Monoculture of prawn was more productive. Prawn and shrimp have a ready market; disposition is relatively faster and there is reduced market competition. Availability of species in local market is affected by the search of producers and traders for better prices. While the export market offered attractive prices, the producers sold more to wholesalers who had the option to channel the products locally or abroad (wholesalers were found to be selling to exporters). Monoculture of prawn was more expensive but it yielded the highest net return. Constraints as seen by the producers boiled down to inadequacy of resources toward profit maximization. On the other hand, local traders wailed the limitations and irregularity of supply to prawn and shrimp in the market. Expansion is a well-entertained idea among operators. Recommendations cited touched the need for introduction of innovation to increase production of prawn and shrimp farm.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Lockwood, Brian and Kenneth Ruddle (eds.)]

TITLE [Small-scale Fisheries Development. Social Science Contribution]

SOURCE [Proceedings of a planning meeting held at East-West Institute (Sep. 6-11, 1976), 1977]

PUBLISHER [East-West Center., Honolulu, Hawaii, USA]

ABSTRACT:

There were a total of (13) papers presented covering the socio-economics of fisheries in Southeast Asia. There were a total of (4) papers presented for the Philippines. The paper in aquaculture covers the cultural and management practices of Bangus ponds in the Philippines (Librero, 1976). The social profiles of aquaculture production in Capiz was also

presented covering the household structure capital intensity, and economic viabilities (Yongonan, 1976). The proposed social science research of fisheries in the Philippines as well as the role of socio-economic research to complement the fisheries development plan were also presented (Samson, et.al. 1976).

SECTION [ECONOMIC APPRAISAL]

AUTHOR [Macalincag, N.G.]

TITLE [Oyster Farming: An Economic Appraisal]

SOURCE [Program in Development Economics Paper]

PUBLISHER [School of Economics, Diliman, Quezon City]

ABSTRACT:

The paper attempts to assess the economic feasibility of oyster farming in one hectare farm at Bacoor Bay, Cavite, using benefit-cost analysis.

The evaluation includes:

- 1) comparative analysis of the oyster project as financing method varies, both from the private and national viewpoints.
- 2) effect on the social desirability of the project by providing for subsidy loan.
- 3) effect of income tax deductions on the profitability of the investment.

The study concluded that the oyster project gives a high rate of return both from the national as well as the private viewpoint. To make this particular study more comprehensive, the direct quantifiable benefits should be supplemented by a subjective assessment of the indirect benefits that could be derived from the project.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Maclean, J.]

TITLE [Small-scale integrated farming in the Philippines]

SOURCE [NAGA, Vol. 10, no. 1., 1987., pp. 11-12]

ABSTRACT:

Details are given of a project in the Philippines to design and test small-scale pig-fish and poultry-fish farming technologies. *Oreochromis niloticus* was the fish species used. Economic prospects were found to be favorable.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Magsajo, N.S. and A.R. Librero]

TITLE [Management practices, costs and returns in Siganid fishponds]

SOURCE [Research Paper Series No. 7., 1976]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

Siganid culture was started as a secondary species in milkfish ponds. This gave way, however, to pure siganid culture in some farms. (18) siganid farms were studied. (4) caretakers, and (14) owners were interviewed, all of whom were male, with an average age of 47 years. Most reported that the fishponds are the main source of livelihood in their place of residence, with some claiming that it was an additional form of income, or just a hobby. All operators had received formal education, with owners reaching second year high school, while the caretakers, were a year behind. Farmers were able to harvest their fish about twice a year but these harvests were timed in such a way that there was a continuous supply of "malaya" throughout the year. Annual family income from all sources was higher than the national family average income.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Nazareno, A.M., E.S. Nicolas and A.R. Librero]

TITLE [Milkfish polyculture farming in the Philippines: A socio-economics study]

SOURCE [Research Paper Series No. 8., 1979]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

Polyculture increase production by stocking several fish species together with different feeding habits, thus, utilizing the various ecological niches in the ponds. Moreover, milkfish polyculture increase profits due to stocking of milkfish with high valued species such as prawns, shrimps, crabs and siganids. The objectives are 1) to study the characteristics and social conditions of milkfish polyculture operators and their households; 2) to assess the practices and technology followed in milkfish polyculture; 3) compare the productivity and profitability of various milkfish polyculture fishponds; and 4) compare the productivity and profitability of milkfish polyculture and monoculture operations.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Nicolas, E.S. and A.R. Librero]

TITLE [Some insights into the socio-economic conditions of fish farm caretakers in the Philippines]

SOURCE [Research Paper Series No. 12., 1978, 13 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

This paper attempts to discuss (1) the characteristics of pond caretakers, (2) the working relationship between the pond owners and caretakers, (3) the attitudes and aspirations of pond caretakers, (4) the income and living conditions of fishpond caretakers, and (5) labor absorption in fishponds.

The survey covered 1175 sample fishpond operators monoculturing bangos, the dominant species in brackishwater fishponds in the country.

Almost all caretakers were male with an average age of 46 years. Majority of them have received formal education. Although most are hired full time, on average, caretakers spent about 8 months in the fishpond. The desire to take other employment appeared to be inversely related with the size of the farm.

On hectare of fishpond required approximately 16.8 mandays for all operations in one rearing. Per farm, 198 man days were required. The caretakers contributed about 23% of the labor requirement while other hired laborers, about 69%. The owner and his family contributed only 8%. The demand for labor is high at the start, for pond preparation, and at the end of rearing, during harvesting. Emergency laborers were hired during peak months and paid on a daily basis.

The owner-caretaker relationship typifies an employer-employee relationship. Nonetheless, in many cases, he was also given the chance to participate in decision-making processes.

The caretakers' family was consistently large in all regions averaging 7 members per household. Most of them own a house and lot and reported to receive adequate income to supply their needs.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Nicolas, E.S. and A.R. Librero]

TITLE [A socio-economic study of fish pen aquaculture in Laguna Lake, Philippines, p. 31-41]

SOURCE [Economics of aquaculture, sea-fishing and coastal resource use in Asia... (eds. A.R. Librero and W.L. Collier), 1979]

ABSTRACT:

The study assess the present technology of fishpen culture, its level of productivity and profitability as well as the social conditions of fishpen operators and caretakers in Laguna de Bay or Laguna Lake. A sample of 174 fishpen operators comprising 17.5% of the fishpens located in the lake were surveyed. Data presented in this study refer to the period 1974-75.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Nicolas, E.S. et.al.]

TITLE [A socio-economic study of fishpen aquaculture in the Philippines]

SOURCE [Research Paper Series No. 5., 1976]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

This report is published as part of the program "A socio-economic survey of the Aquaculture Industry in the Philippines," jointly undertaken by the Southeast Asian Fisheries Development Center and the Philippine Council for Agricultural and Resources Research. This report presents the result of a study on fishpen culture. Fish culture in pens has recently been receiving some popularity in the Philippines particularly in Laguna Lake where it is presently a thriving industry. 193 pen operators were surveyed in 11 municipalities, 4 in Rizal and 7 in Laguna. This represents 19.4% of the total fishpens in Laguna Lake. In addition, 19 pen operators in San Pablo were also interviewed. 1/4 of the respondents in Laguna Lake were owners; 3/4 were operators. In contrast, 68% of the respondents in San Pablo City were owners. There were only 6 female operators. On the average, operators, were 43 years old, with owners slightly older than caretakers. The operators with higher educational levels tended to work in other occupations in addition to fishpens. Owners spent nearly 1/2 year on fishpen operations, 6.4 months on other operations, and only about 1/2 month per year not in gainful employment.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Nicolas, E.S. and F.L. Parducho]

TITLE [A socio-economic survey of Aquaculture Industry in Central Visayas]

SOURCE [Research Paper Series No. 14., 1979]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

The objectives of this study are: 1) to study the socio-economic conditions of fish producers and related population in Central Visayas; 2) to determine the business practices and costs and returns in fry buying and marketing; 3) to determine the cultural practices and costs and returns in fishpond operations and 4) to determine the problems besetting the industry and technical support required.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Ongchangco, B.]

TITLE [Marketing Practices in the Philippine Fishing Industry]

SOURCE [Philippine Fisheries., A Handbook prepared by the Technical Staff., 1952., p. 139-148]

PUBLISHER [Bureau of Fisheries, Manila]

ABSTRACT:

Bangus fry are sold in palayok of 15-30 liters capacity containing about 2,300 fry. Sales are transacted at the beach where the fry are brought ashore. Representative of fishpond operators are the buyers. The unsold balance is usually taken to Manila by the concessionnaires or their agent by truck, railroad or airplane. Fishpond operators from localities around Manila Bay go to Bangus fry depots and international airport to purchase bangus fry. Purchases are made by the laksa (10,000), all transactions in terms of the quantity and price after dead fry amounting to 5%-25% of the original shipments have been removed in accordance with the prevailing market price dictated by the supply and demand.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Orduna, A.G. and A.R. Libroero]

TITLE [A Socio-economic study of Mussel Farms in Bacoar Bay]

SOURCE [Research Paper Series No. 2., 41 p.]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

This document is published as part of the research program "A socio-economic survey of the Aquaculture Industry in the Philippines" jointly undertaken by the Southeast Asian Fisheries Development Center and the Philippine Council for Agricultural and Resource Research. This part reported on mussel farms in Bacoar Bay. A sample of 30 mussel farms was investigated. The average age of the mussel farmers was 42 years, with an average experience of 7.3 years in mussel farming, and schooled for 6.3 years. He spent less than one full month in his farm and about .75 years in other occupations; for about 2.5 months he was not gainfully employed. The oldest of the farms study began operation in 1955. The mussel farms used staking as a method of culture, mussels are harvested 8 months after the stakes were placed, depending on the size of the mussels and market demand. Almost all staking was done in April. Peak months of the harvesting were November and December. Most of the farmers sold the mussel on a direct wholesale basis, though some worked on contract.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Padilla, J.E.]

TITLE [Economics of technology adoption: The case of brackishwater aquaculture in Bulacan, Philippines]

SOURCE [M.S. Thesis, University Pertanian Malaysia., 1985., 135 p.]

ABSTRACT:

Brackishwater fishpond are traditionally devoted to milkfish culture. However, for the past 3 to 4 years, brackishwater milkfish operators in Bulacan, Philippines have been culturing tilapia in addition to their milkfish cooperatives. Owing to the dearth of primary data on this aspect, reasons advanced by the researchers on the emergence of such practice were based on secondary information.

The purpose of the study was to provide information on the circumstances surrounding the phenomenon of culturing tilapia in traditional milkfish system. The underlying reasons for the shifting to tilapia culture were investigated. Another objective was to identify and measure factors which tend to encourage or restrain the adoption of such practice. The analytical tools included costs and returns analysis in addition to models specified in the context of innovation adoption. Information for the study was obtained from a sample survey of fishfarmers in Bulacan, Philippines. The survey covered 1983-84 crop year. Additional data from a previous survey in the study area reporting 1979 crop year were also included in the study.

Between 1979 and 1983-84 crop years, milkfish producers were caught in a cost-price squeeze as input costs rose more rapidly than output prices. As a result, milkfish culture profitability declined considerably and some milkfish farmers shifted to other species, particularly, tilapia. These farmers (adopters) were found to be the marginal and less efficient milkfish growers and the culture of tilapia provided higher returns than the old practice. Net return accruing from tilapia culture amounted to 1,125 pesos per cropping per hectare which was 3 times more than profit realized in milkfish culture. This was due to the fact that tilapia required less material inputs than milkfish. Using logistic regression techniques, technical and socioeconomic variables were hypothesized to explain the decision to adopt the new practice. Significant variables were perception on profitability and capital requirements of the innovation, extension contact, milkfish culture experience and market accessibility. The intensity or extent of adoption model was specified in semi-logarithmic form with essentially the same set of explanatory variables as in the adoption model. 4 variables were significant, namely: tilapia culture experience, distance of pond from coastline and the perception variables on the innovation (profitability and capital requirement). From the foregoing results, it was concluded that the shift by milkfish farmers to other species, particularly tilapia was profit-motivated. Farmers' perception of the innovation were related to adoption behavior actually taken. Moreover, management ability was an important determinant in innovation adoption and in the quantity of innovation to secure. At the same time, consideration of physical factors such as salinity of pond water was imperative in the frequency of tilapia cropping. Extension contact and access to printed materials on aquaculture significantly influenced adoption decision.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Pamulaklakin, E.R., R.C. Dizon and D.G. Ramos]

TITLE [A Socio-economic Survey of the Aquaculture Industry of Southern Luzon]

SOURCE [Research Paper Series No. 25., 1979, 94 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

A total of 580 respondents were personally interviewed and distributed as follows: 193 fishpen operators, 119 bangos monoculture operators, 103 bangos polyculture operators, 45 oyster farmers, 30 mussel farmers, 29 freshwater fish farmers, 48 fry gatherers, 7 fry concessionnaires and 6 fry dealers.

An average fry gatherer was a male, 38 years of age and had 4.5 years of schooling. The concessionnaires and dealers were likewise male with an average age of 60 and 55 years respectively. All had schooling averaging 7 years for the former and 6 years for the latter.

Due to fry seasonality, operators engaged in other occupations other than in aquaculture. Fry gathering was done almost everyday of the week with the majority (65%) collecting from morning till evening.

The most common method of collecting different species of fry was through the use of sagap which were mainly provided by the concessionnaires. Sorting was done before the fries are sold. Fry are counted by the use of pebbles and similar markers as well as tally sheets and estimation methods.

Forty-four percent of the gatherers sold their fry to concessionnaires, 25% sold to dealers and the rest to nursery and rearing pond operators. Forty six percent of the fry are purchased by rearing pond operators while the rest sold to nursery pond operators.

Concessionnaires and dealers realize positive net earnings.

Fish farming in Southern Luzon is devoted primarily to the culture of milkfish. Culture of tilapia and carp is not as popular in the region compared with other regions. Laguna de Bay fishpens also produced milkfish as the primary species and a few freshwater species secondarily.

Forty five percent of the operators interviewed were owners and 32% were caretakers, most of them were male with an average age of 52 years.

Bangos farming seemed to be a part-time job of the operators since a large part of their time was spent in other occupations. The caretakers spent most of their time in pond operations.

Operators used both organic and inorganic fertilizers. Chemicals were used to eradicate pests. Supplementary feeds like rice bran, bread crumbs and other feeds such as copra meal and hogwash were used.

Harvests are sold either at a wholesale or retail basis. Higher earnings were derived from polyculture farms than from monoculture farms.

Tilapia farms which had the largest average area among the freshwater farms incurred the highest expenditures, however on a half hectare basis, carp farms which had the smallest average area incurred the highest expenditure suggesting the carp farms were the more capital intensive among the freshwater farms studied.

Fish culture in pens is a thriving business in Laguna de Bay. Bangos was the predominant species cultured in Laguna Lake fishpens and tilapia in San Pablo lakes.

Three fourths of all surveyed pens laid their pens idle for an average period of 15 weeks mostly in November, December, January and February. Because of the free entrance of tilapia seeds, almost all the pens in San Pablo lake had continuous operation throughout the year.

Due to the insufficiency of natural food in the lake, 88% of the fishpens used supplementary foods, the most common of which was bread crumbs given at the rate of 249 gantas per hectare.

Rearing took about 6 months from stocking to harvesting hence the number of rearings ranged only from one to two years. The date of the harvesting was primarily determined by the size of fish.

Fishpen culture is more labor intensive than either fishpond farming or crop farming. In addition to caretakers, laborers/helpers were also hired.

Majority of the pen owners sold their crop by direct wholesale while others sold by direct retail, consignment, and by contract. The price per kilo of bangos was highest when sold by contract and the lowest price was received by direct retailing.

Seafarming of oysters and mussel were monopolized by the male sex with an average age of more than 40 years. Most of the operators reached school averaging 6.3 years.

The operators used about 2 months in seafarming and about 7 1/2 months in other occupations.

Oyster and mussel are raised in the region either by stake or "patasok" and hanging or "pabitin". Oysters were raised by both stake and hanging while mussels were raised only by stake method. Harvesting make use of boats to load the crop.

Seafarmers enjoy positive net earnings. Cash expenses comprise the bulk of total expenditures.

Labor in seafarms came from owner-operator, caretaker, family, hired and exchange labor.

Problems besetting the aquaculture industry in the region include scarcity of fry in the fry business; for fishpond operators - weather condition, insufficiency of technical support, unavailability of fingerlings, robbery and unavailability of area for expansion; water pollution, natural disturbances, robbery, unfavorable price structure and difficulty in obtaining permit for seafarmers.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Philippine Bureau of Fisheries]

TITLE [Philippine Fish Marketing and Distribution Study]

SOURCE [Statistics on Catch and Consumption, Vol 2., 1975., pp. 1-93]

PUBLISHER [Nor Consult A.S. in association with IKO Consulting Group]

ABSTRACT:

This volume deals with statistics on catch and consumption from different mainly as a basis for projecting future demands. The most reasonable future demand of fish is 3.4 million tons in 1985, of which 3.0 * is for human consumption and 0.4 for fish meal. The possible "gap" between projected demand for human consumption and production may result in one or more of the following decisions: exports of fish and fish meal production should be developed. Production targets should be changed to more conservative objectives regarding modernization of fishing boats and gears. The demand for first class fresh fish and crustaceans will increase significantly more than the demand for dried and smoked fish mollusk and eared fish. The demand for milkfish, maccarel, shrimps, and crabs will increase significantly more than the demand for slipmouth and roundscads. The demand for fish will increase significantly more in Luzon and Mindanao than in the Visayas.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Platon, R.R.]

TITLE [Design, Operations and Economics of Small-scale hatchery for the larval rearing of sugpo, *Penaeus monodon*]

SOURCE [Extension Manual No. 1., 1978]

PUBLISHER [Aquaculture Department, Southeast Asian Fisheries Development Center., Tigbauan, Iloilo, Philippines]

ABSTRACT:

The barangay hatchery project under the prawn program of AOD-SEAFDEC has scaled down the hatchery technology from large tanks to a level which can be adopted by the private sector especially in the village, with minimum financial and technical inputs. This guide to small-scale hatchery operations include technical and economic aspects which can generate more enthusiasm among those who are interested in venturing into sugpo culture.

SECTION [ECONOMIC APPRAISAL]

AUTHOR [Posadas, B.C.]

TITLE [Economic Analysis of various prawn farming systems, p. 12-24]

SOURCE [Technical considerations for the management and operation of intensive prawn farms (eds. Y.N. Chiu, L.M. Santos and R.O. Juliano)., 1988]

PUBLISHER [U.P. Aquaculture Society, Iloilo City, Philippines]

ABSTRACT:

The profitability of various prawn farming systems is determined by the prawn market on one hand and the input market on the other hand. Risk factors include price fluctuations, low production levels, occurrence of diseases, legal restrictions and deteriorating peace and order conditions. The possibility of a glut in the traditional prawn markets is not remote and when this happens, farms with lower production costs will survive. A comparative economic evaluation of the extensive, modified extensive, semi-intensive and intensive methods which yield 280, 798, 2,450 and 6,300 kg/ha/crop, respectively, was made. Development cost on per unit area basis, and operating cost on a per kg prawn basis, are higher with more intensive methods. But on borrowed capital, the fixed cost to produce a kg of prawn is higher by about threefold for the extensive and twofold for the modified extensive when compared with the semi-intensive and intensive methods. Analysis showed highest net profit on a per kg basis for the semi-intensive method but higher total profit for the intensive method because of higher production. The extensive method is not profitable considering the time value of money while the other three methods are profitable under static market conditions. The semi-intensive method is the most stable method, being less sensitive to dynamic changes in input and output market. Undiscounted and discounted economic indicators were used.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Rabana1, H.R.]

TITLE [Status and prospects of shrimp farming in the Philippines]

SOURCE [1986., ASEAN/SF/86/Tech-3., 28 p.]

ABSTRACT:

Captured shrimps and prawns in the Philippines, which consist mainly of non-exportable species, have fluctuated from 30,000 to 50,000 mt/year and has levelled off. Culture production of penaeid shrimps however has shown accelerated growth especially during recent years and their trend is proceeding. There is a large local market and a very attractive foreign market for specific types of cultured shrimps. Present status, recent management innovations, and the potentials of the Philippine shrimp culture industry are analyzed.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Rabana1, H.R.]

TITLE [Aquaculture in Southeast Asia]

SOURCE [1977., 10 p.]

PUBLISHER [South China Sea Fisheries Program, Manila]

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Ramos, D.G. and Lapie, L.P.]

TITLE [The Culture of Freshwater Catfish (Clarias Spp.) in the Philippines: A Socio-economic Study]

SOURCE [Research Paper Series No. 22., 1979, 35 p.]

PUBLISHER [SEAFDEC-PCARR, Los Banos, Laguna]

ABSTRACT:

The study covered 43 respondents distributed in 7 provinces throughout the country with the bulk (54%) of sample farms coming from Nueva Ecija in Central Luzon, followed by Isabela (21%) in Cagayan Valley and Laguna (12%) in Southern Luzon.

Majority of the operators were male with an average age of 53 years. An average operator had experience in catfish farming for 7 years gained mostly (6.8 years) in his present pond. All the operators attended school.

Catfish fingerlings were predominantly purchased and given by other fishpond operators all within the municipal location of the fishponds. Stocking was usually done once a year during the late afternoon.

Only 28 of the 43 catfish farms practiced supplementary feeding. The types of supplementary feeds used were rice bran, bread crumbs, starter mash, chicken entrails and termites, however, the last two types were not given regularly.

The average mortality of catfish reported from purchase to stocking

was 5% and 20% from stocking to harvesting in pure catfish in pure catfish farms and 5% in combination farms.

The bulk of the catfish harvest from the the farm went to market. The rest were either consumed at home or given away as gifts to friends and relatives. Most of the operators sold their crop on retail at an average price of P6.02/kg.. Majority (73%) of the operators delivered their crop to their buyers with an average charge of P2.75 per delivery.

Bulk of the capital investment went to land. Combination farms received larger gross income compared to pure catfish farms.

The number one problem faced by the industry was the unavailability of technical support. Other problems reported were the unavailability of credit, lack of proper infrastructure, poaching, lack of fingerlings, water pollution and availability of water facilities. To these problems, solutions such as extension of technical assistance, credit assistance, provision of fingerlings, installation of deep well pumps and provisions of better breeds of fingerlings were suggested by respondents.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Ramos, D.G.]

TITLE [A socio-economic survey of the aquaculture industry of Cagayan Valley]

SOURCE [Research Paper Series No. 9., 1978]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

The aquaculture industry in Cagayan Valley is composed of fry gathering and marketing, fish farming bangus and freshwater fish farming of tilapia, carp, catfish, etc., and oyster farming. The objectives of this study are: 1) to study the characteristics of fry gatherers, concessionnaires, dealers, fish farmers and oyster farmers; 2) to assess the practices and technology followed in collecting and marketing of fry; 3) assess the cultural practices and management of fish and oyster farms.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Ramos, D.G. and T.G. Aspuria]

TITLE [A socio-economic survey of Milkfish Farmer in Eastern Visayas]

SOURCE [Research Paper Series No. 16., 1979]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

The objectives of this study are: 1) to study the characteristics and social conditions of milkfish farmers in Eastern Visayas; 2) to assess the practices and cultural management of milkfish farmers; 3) to analyze the stocking and cropping patterns in milkfish farms; 4) to estimate capital investments, costs and returns in milkfish farms; 5) to measure labor requirements and study relationships between fish farm owners and caretakers.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Samson, E.]
 TITLE [Recent, Current and Proposed Research by Social Scientists on Small-scale Fisheries Development in the Philippines]
 SOURCE [Proceedings Small-scale Fisheries Development (eds. Lockwood, et.al.), 1976]
 PUBLISHER [East-West Center, Honolulu, Hawaii, USA]

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Samson, Elizabeth, Florentina A. Tan and Aida Librero]
 TITLE [The socio-economic research studies to complement Fisheries Development Plan in the Philippines]
 SOURCE [Small-scale Fisheries Development (eds. Lockwood, Et.al.), 1976]
 PUBLISHER [East-West Center, Honolulu, Hawaii, USA]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Shang, V.C.]
 TITLE [Follow-up programmes on the economics of Aquaculture in the South China Sea Region]
 SOURCE [1976., 19 p., (SCS/76/MP/39)]
 PUBLISHER [South China Sea Fisheries Program, Manila]

SECTION [ECONOMIC APPRAISAL]

AUTHOR [Shang, V.C.]

TITLE [Economic Comparison of Milkfish Farming in Taiwan and the Philippines, 1972-1975]

SOURCE [Aquaculture 9(3)., 1976., pp. 229-236]

ABSTRACT:

Economic surveys of milkfish production in ponds in Taiwan, and the Philippines for 1972 are compared and the economic changes that occurred in the Milkfish Industry 1972-1975 in both countries were discussed. The relative costs of production in these countries were evaluated in terms of output per unit of input (land and labor) and by comparing differences in production and marketing per unit of output. The advantages and the disadvantages of the different milkfish farming practices in these countries were also explained.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith I.R., M.Y. Puzon, and C.N. Vidal-Libunao]

TITLE [Philippine Municipal Fisheries: A review of resources, technology, and socio-economics]

SOURCE [1980]

PUBLISHER [ICLARM., Makati, Metro Manila]

ABSTRACT:

Recent research findings related to the technology and socio-economics of small-scale municipal fishermen in the Philippines and the open-access resources they exploit are reviewed. Evidence is provided of a trend towards over-fishing of Philippine coastal waters and of willingness of fishermen to consider alternative activities to capture fishing. Also documented is the encouraging shift in emphasis of government programs from a resource-development orientation to one of resource management. The review concludes with the discussion of the implications of these research findings to fisheries management and research.

SECTION [ECONOMIC APPRAISAL / POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R.]

TITLE [The Economics of Milkfish Fry and Fingerling Industry in the Philippines]

SOURCE [ICLARM Technical Report No. 1., 1981., 148 pp.]

ABSTRACT:

The purpose of this study was to evaluate the allegations regarding the imperfections in the Fry Industry and to determine the effects of related

fishery policy. This technical report is the first of several that deals with the economics of various aspects of milkfish (*Chanos-chanos*) industry. It concentrates on the fry and fingerling industries in the Philippines.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Smith, I.R. et. al.]

TITLE [Preliminary Analysis of the Performance of the Fry Industry of the Milkfish (*Chanos-chanos.forsk*) in the Philippines]

SOURCE [Aquaculture 14(3), 1978., p. 199-219]

ABSTRACT:

The fry industry of the milkfish (*Chanos-chanos*) in the Philippines is alleged to suffer from certain inefficiencies principal among which are annual shortages to meet the stock requirements of 176,000 has. of fishponds in the country, and the failure of the pricing system to direct and allocate the fry resources geographically. Contrary to these allegations, this paper presents a preliminary analysis that hitherto supposed. Specifically, fry catch is estimated to be 1.3T billion, sufficiently high to meet the present stocking requirements; less than 3% of trade flows between region overlaps, and monthly average fry prices between tradings regions are significantly correlated, indicating the system's response to supply and demand changes and other stimuli.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Smith, I.R., F.C. Cas, B.P. Gibe and L.M. Romillo]

TITLE [Interregional trade and price relationships for Philippine Milkfish Fry, p. 43-60]

SOURCE [Economics of Aquaculture, sea-fishing and coastal resource use in Asia (eds. A.R. Librero and W.L. Collier., 1979)]

ABSTRACT:

The research project on the marketing and distribution of milkfish in the Philippines is an extension of the joint project begun in 1975 by SEAFDEC and PCARR entitled "Socio-economic Survey of the Aquaculture Industry in the Philippines." Major objectives of fry marketing are: 1) to describe marketing channels, costs, and the socio-economic relationships between fry gatherers-middlemen and rearing pond fishpond operators; and 2) to analyze the pricing efficiency of the fry distribution system. This preliminary paper presents initial findings regarding interregional trade flows and the relationship between average monthly fry prices in the major market areas.

The preliminary results of the project document the existence of a milkfish fry system in the Philippines that is national in scale, with a predominant role played by concessionnaires and dealers in Mindanao and by nursery pond operators in Bulacan and Rizal. Fry trade between regions appears

efficient in the narrow sense that there is minimal overlapping of imports and exports. Exceptions can be explained by the three major factors that limit potential market sources and outlets for buyers and sellers; that is 1) by mistrust due to lack of accurate counting mechanism; 2) by financial constraints of sellers due to cash advances from and partnerships with buyers, particularly in Bulacan and Rizal; 3) by the BFAR permit and auxiliary invoice system that prohibits interregional transport of fry except by pond operators or their authorized representative.

Correlation coefficients computed between monthly weighted average prices for 17 trading partners also show a system that is efficient in transmitting information regarding demand, supply, and other stimuli between regions. The relationship between regional fry prices was found to be highly significant or significant in all cases examined.

SECTION (ECONOMIC APPRAISAL/ POLICY AND MANAGEMENT)

AUTHOR [Smith, I.R.]

TITLE [An Economic Analysis of the Structure and Performance of the Milkfish (*Chanos-chanos*, Forskal) Fry Industry in the Philippines and Related Aquaculture Development Policies]

SOURCE [Ph.D. Dissertation in Agricultural Economics., University of Hawaii, Honolulu., 1978., 307 p.]

ABSTRACT:

The fry industry of the milkfish in the Philippines is alleged to suffer from certain imperfections. Primary among these are annual shortages of catch to meet the stocking requirements of 176,000 hectares of fish ponds, high fry mortality rates in transport, the failure of the pricing system to perform its spatial and form allocative functions, and exploitation of fry gatherers and pond operators by middlemen. These alleged imperfections provide the rationale for government policies affecting the fry industry.

Several factors were found to reinforce tendencies towards an hierarchical fry distribution system, including nationwide fry demand and more localized supply points, economies of scale in transport, and the concession system which awards fry grounds exclusive use rights to the highest bidder.

Risks and uncertainties arise due to extreme price fluctuations caused by a highly seasonal catch, to the perishability of fry, and to the opportunistic behaviors of buyers and sellers throughout the industry. Strategies of the intermediaries to minimize these risks through vertical and horizontal integration and various financing arrangements shorten the marketing chain to an average of 2-7 title exchanges and temper the development of market hierarchies.

Contrary to allegations, research indicated a higher level of industry performance than hitherto supposed. Fry catch was estimated at 1.35 billion for 1974, adequate to meet the annual stocking requirements. The large volume of interregional trade in 1976 (74.5 million) and low fry prices in 1977 provide additional supportive evidence of adequacy. Allegations of fry shortages are based on simultaneous underestimation of catch and overestimation of stocking requirements and were traced to price increases resulting from expanded fish pen

area.

Fry shortage and transport mortalities of 8.7% and 8.6% respectively, compared with mortality rates of 54% during rearing, indicated that major technical inefficiencies arise in fish ponds rather than in the distribution system. Of every 100 fry caught, 38 are harvested at marketable size.

Profit rates were positively correlated with subsector concentration ratios. Fry gatherers return was lowest at P5 per gathering day; concessionnaires average 3.6% return on their labor, capital, unpaid family, labor management and risk; dealers 14.9% and nursery pond operators, 27.7%. Gathering costs represent 57% of the average P58 per thousand fry cost to pond operators in 1976; marketing costs represented 43%.

Monthly average fry prices between 17 major trading regions were significantly correlated indicating a high level of information flow in the industry. Spatial price differential, however, significantly exceeded transfer costs during non-peak season. Farm price differential consistently exceeded costs of rearing fry to fingerling size (excluding entrepreneur's capital, labor, management and risk).

Philippine government policies that restrict free trade in fry were analyzed. Examinations of the concession system indicated that concessionnaires are unable to capture their full monopsony advantage due to the competitive fringe of smugglers. Rather than exploitation, the concession is a form of indirect municipal tax on fry gatherers. Interregional trade restrictions of Fisheries Administrative Order 115 were found to hinder rather than enhance the pricing and technical efficiencies of the fry marketing system, and resulted in extremely high hidden costs due to increased mortality. Additionally, export prohibitions resulted in the halting of fry gathering in 1977 when prices fell to a level too low to compensate gathering efforts.

Finally, since the fry industry is a 57 M per year industry upon which approximately 170,000 individuals directly and indirectly depend, it was suggested that the location of future milkfish hatcheries and timing of their production be planned such that they complement rather than displace the natural fry fishery and distribution system.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Tan, R.L.]

TITLE [A Bioeconomic Analysis of Cage Culture of Tilapia in Sampaloc Lake, San Pablo City, Laguna]

SOURCE [M.S. Thesis, UP Los Baños., 1987, 171 p.]

ABSTRACT:

The main concern of this study is three-fold. First, to document the grow-out cage operation in Sampaloc Lake; second, to determine and quantitatively assess the different determinants of cage culture of tilapia in a multidisciplinary fashion using a production function framework and; third, to assess the profitability of the cage operation business on an industry average basis.

The explanatory variables found to have significant impacts on yield were number of pieces of tilapia harvested per kilogram, number of times of harvesting, fingerling size of stocking, depth of lake area occupied by cage structure, stocking density, mortality during stocking and total area of cages within 50 meter periphery. Supplemental feed interacts with pieces per kilogram

and total area of cages within the peripheries and becomes significant when the former was omitted and the latter included in the model. It is concluded that it is better to grow tilapia in the northeastern and/or northwestern parts of the lake particularly at the shallower portion regardless of the distance from shore given the existing ecological conditions.

Overcrowding as measured through the number of cages within the immediate neighborhood was in general not a major factor affecting yield, primarily because of supplemental feeding. However, when no feeding is done, an overcrowding effect does register.

For the income analysis, the values of the financial feasibility indicators are strong manifestations that the industry is a lucrative investment opportunity. With an internal rate of return of 61%, a short payback period of 1.3 years and an earning capacity of one peso and forty centavos for every peso investment, this would explain why operators or new investors continue to enter in this business venture.

And in an attempt to widen the extent of use of this study, all relevant informations related to cage operations were illustrated.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Tan, G.R. and P.F.S. Cruz]

TITLE [Status and Prospects of the Shrimp Industry, p. 1-6]

SOURCE [Technical Considerations for the Management and Operation of Intensive Prawn Farms (Y.N. Chiu, L.M. Santos and R.O. Juliano)., 1988]

PUBLISHER [U.P. Aquaculture Society, Iloilo City, Philippines]

ABSTRACT:

The past decade has been marked by a dramatic increase in world demand for shrimp, with an increasing share contributed by aquaculture. Many countries are competing to capture this lucrative market. Taiwan, Indonesia, China, Thailand and India are the major producers in the Asia-Pacific region, while Ecuador and Mexico are the major producers in Latin American region. The three major markets for shrimps are Japan, United States, and Europe, with Japan having the highest per capita consumption and being the major market for Philippine shrimps, mainly composed of the black tiger, *Penaeus monodon*.

Prawn production through aquaculture has tremendously increased in the Philippines in the recent years because of the availability of technology for hatchery in pond grow-out operations. Technological problems resulting in diseases, poor growth and production and problem in financing of prospects are the major constraints. A global shrimp supply glut is not remote and the industry may be able to survive this challenge by maintaining quality, increasing production and improving cost efficiency. The close collaboration among private, government and research sectors is necessary to attain this goal.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Tidon, A.G., and A.R. Librero]

TITLE [A Socio-economics study of Tilapia farming in the Philippines]

SOURCE [Research Paper Series No. 10., 1978., 92 p.]

PUBLISHER [SEAFDEC-PCARR Research Program., Los Banos, Laguna]

ABSTRACT:

In recent years, the milkfish industry had been facing problem of fry shortages. The price of fry has also increased due to limited supply and increased demand. Another species such as tilapia, is needed in order to meet this demand. The objectives of this study are : 1) to determine the characteristics and social conditions of the tilapia farmers; 2) to assess the technology and practices followed in tilapia culture; 3) to determine the pattern of input used in tilapia farming; 4) to analyze costs and returns from tilapia culture.

SECTION [ENVIRONMENTAL CONCERNS]

AUTHOR [Tidon, A.G. et.al.]

TITLE [Identifying constraints in increasing milkfish pond production in Luzon
a preliminary report]]

SOURCE [Research Paper Series No. 23., 1979]

PUBLISHER [SEAFDEC-PCARR Research Program., Makati, Metro Manila]

ABSTRACT:

This study seeks 1) to measure the extent of differences in productivity of milkfish farms and analyze factors that explain these differences, 2) to identify the constraints to higher pond productivity and ascertain the reasons why farmers' yield is lower than what is technically possible under controlled conditions, 3) to analyze the relative importance of these constraints to possible yield increase, 4) to study the differences in physical, social and economic environment of high productivity and low productivity milkfish farms, 5) to identify the other socio-economic constraints in increasing productivity.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Tidon, A.G.]

TITLE [A Socio-economic Survey of the Aquaculture Industry of Central Luzon]

SOURCE [Research Paper Series No. 13., 1979, 102 p.]

PUBLISHER [SEAFDEC PCARR, Los Banos Laguna]

ABSTRACT:

The purpose of this study is to provide some insights on the

socio-economic conditions of people involved in inland fisheries particularly the fry gatherers, fry concessionnaires and fishpond operators, and assess their business practices and estimate their costs and returns and the labor requirements. The market structure of the fry and rearing pond industry were also analyzed.

A total of 370 respondents were interviewed with fishponds monoculturing bangos constituting the largest number (304), 4 for bangos polyculture ponds and 47 for ponds stocked with freshwater fishes. In addition, eight bangos fry gatherers and 7 concessionnaires were interviewed in the provinces of Bataan and Zambales.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Uwata, K.R. and R. Tumaliuan]

TITLE [An assessment of the Metro Manila market for seabass, bighead carp, and red tilapia]

SOURCE [1985., 45 p.]

PUBLISHER [Aquaculture Department, SEAFDEC, Tigbauan, Iloilo, Philippines]

ABSTRACT:

Three sectors of the fish market in Metro Manila were surveyed to obtain baseline information on the seabass, *Lates calcarifer*, the bighead carp, *Aristichthys nobilis*, and the red tilapia, *Oreochromis sp.* Specific information was solicited on (1) public awareness of these fishes; (2) current seabass consumption patterns; and (3) market demand for these species. The three sectors surveyed included: (1) retail fish markets, (2) restaurants (that sold fish), and (3) consumer households.

The retail fish market sector was more familiar with these key species compared with restaurant and consumer sectors. Each sector provided different reasons as to why these fishes were not purchased. Responses also varied between species.

Current consumption of seabass is limited. Only 21 percent of retail fish markets, 9 percent of restaurants, and 14 percent of consumer households purchased this fish. Cultured seabass appeared to command higher prices than wild-caught fish. In addition, there was a size price relationships evident in which larger fish commanded higher prices. In the restaurant sector, there is interest in selling live seabass.

A rough estimate of market demand was made for these three species. Of these three species, red tilapia appeared to have the highest demand function. However, there is large variance associated with these estimates. If prices of these species were reduced to the current price of milkfish, milkfish demand would be greater than that of these fish species. Market information of these three species is documented in this study. A comparison with production economics data is now needed to identify culture systems and species that are highly profitable or can provide the most protein for domestic consumption.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Valdellon, T.C., C.N. Arancillo and C.A. Parado]

TITLE [A study of prawn/shrimp production and marketing system in Negros Occidental]

SOURCE [Agricultural Marketing Report Vol. VII, No. 5., 1985., 127 p.]

PUBLISHER [BAECON]

ABSTRACT:

-discussed and analyzed the production and marketing system of prawn and shrimp in Negros Occidental

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Valdellon, M.B., M.M. Viola, L.M. Hernandez, I.G. Tades and R.A. Beronio]

TITLE [Analysis of the production and distribution patterns of prawn and shrimp in Zamboanga del Norte]

SOURCE [Agricultural Marketing Report, Vol. VII, No. 10., 1985., 96 p.]

PUBLISHER [BAECON]

ABSTRACT:

Despite limited capital resources and inadequate supply of fry and other inputs, producers were still inclined to produce prawn or shrimp than other fishpond species due to the increasing demand for the product in the foreign market. Flow of product was mostly confined between producers and big-time traders; less between farmers and the commercial outlets. Consumers therefore obtain portion of the harvested quality with low quality. Several factors affect prices of prawn. Among which are the size of the product, prevailing market prices and quality. Production profitable among operators who cultured prawn and shrimp as well as milkfish and other species. The problems of capital, technologies, and inputs shortage were experienced by fishpond operators. Study recommends the review of loan policies of government and private financial institutions, the establishment of hatcheries in strategic areas in the country to assure steady supply of fry, more training centers/schools to teach investors technical knowhow in aquaculture operations, fishpond development and management information dissemination.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Valiente, A.M., Jr.]

TITLE [Marketing of major agricultural products in Iloilo Province]

SOURCE [Report No. 75-11., Special Studies Division, Department of Agriculture., Quezon City., 1975]

ABSTRACT:

This study includes a detailed description of the marketing practices used by milkfish middlemen in Iloilo, Philippines.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Vera Cruz, W.C. and I.P. Carlos]

TITLE [Marketing of major agricultural products in Lanao del Sur]

SOURCE [1974., 59 p.]

PUBLISHER [Special Studies Division, Department of Agriculture, Quezon City]

ABSTRACT:

The study of agricultural products marketing in the province of Lanao del Sur, includes a section on marketing of fish by producers and middlemen, market facilities, geographic flow of fish as well as recommendation for improving the marketing systems.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Wear, R.G.]

TITLE [SEAFDEC Aquaculture: a seafood revolution in the Philippines]

SOURCE [Fishfarming 2(2)., 1975., p. 6-11]

ABSTRACT:

Discussion of plans, budgets, activities, and significance of the new aquaculture department of the Philippine headquarters of the Southeast Asian Fisheries Development Center (SEAFDEC) includes information on efforts to develop the culture of *Penaeus monodon* and other penaeid species. Japan provides a ready export market and shrimps have been harvested as a source of secondary, supplement income on milkfish (chanos-chanos) farms. Experimental cultural techniques were indicated. Information is provided on yields, prices, capital and operating costs, along with the assessment of possible profitability on the basis of 1 hectare experimental ponds, which SEAFDEC interests and support, 5 hectare farm ponds are being operated on a cooperative basis with farmers to determine if yields, costs and other factors will indicate an economically viable situation over a 5-year period.

SECTION [PRODUCTION AND/OR MARKETING]

AUTHOR [Yap, W.G., F.D. Apud, J.H. Primavera]

TITLE [Manual on Prawn Farming]

SOURCE [Aquaculture Extension Manual No. 5., 1978., 47 p.]

PUBLISHER [Aquaculture Department, Southeast Asian Fisheries Development Center, Tigbauan, Iloilo]

ABSTRACT:

Aside from the technical aspects of prawn farming, this manual includes the business aspects including comparative economics of the different systems of prawn farming.

SECTION [SOCIOECONOMIC ASPECTS]

AUTHOR [Yongoyan, A.A.]

TITLE [Household Structure, Capital Intensity and Economics Viability: Social Profiles of Aquaculture Production in Capiz, Province, Philippines]

SOURCE [Small Scale Fisheries Development (eds. Lockward, et.al.), 1976]

PUBLISHER [East-West Center, Honolulu, Hawaii, USA]

ABSTRACT:

The paper deals with two specific aspects of household economy: 1) an analysis of household types found among fishpond owners and operators in Capiz, Western Visayas, Philippines; 2) a preliminary discussion of workers and consumer ratio in households among fishpond operators. The particular focus of the field study was on commercial fish pond operators and deep-sea fishermen in the province of Capiz, which is located on the northern side of the islands of Panay. The aquaculture industry in Capiz will survive as long as the link between owner/operator and the mode of production is maintained.

MARINE FISHERIES

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Adriano, A.H.]

TITLE [Creation of the Rules and Regulations of the Fishery Laws of the Philippines]

SOURCE [Proceedings. First International Colloquium on Fishery Legislation., 1981., pp. 133-147]

TEXT LANGUAGE [English].

SUBJECT DESCRIPTORS [fishery regulations]

GEOGRAPHIC DESCRIPTORS [exploitation, marine resources, marine parks, pollution control, fishery industry, ISEW, Philippines]

ABSTRACT:

The Philippines fishery laws include: 1) administration and use of deep water fishery resources rules; 2) laws on the commercial fishery operation; 3) importation and exportation of live and processed fish; 4) conservation measures that include prohibition on importation and exportation of certain fish species, fishing with fine mesh nets, use of certain fishing tools in some marine areas and the prevention and control of marine pollution. Also the establishment of marine reserves and sanctuaries, closed season zones and regulations that include the foreign participation in the exploration, development, exploitation and use of the fishery resources; 7) problems that affect the fishery industry; 8) adopted measures to fight the problems that arise in the fishery resources area.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Aguero, M.]

TITLE [Economic Consequences of Excessive Effort, pp. 164-169]

SOURCE [Indo-Pacific Fishery Commission. Papers presented at the Symposium on the Exploitation and Management of Marine Fishery Resources in Southeast Asia held in conjunction with the Twenty-second Session of the Indo-Pacific Fishery Commission, Darwin, Australia, 16-26 February 1987. RAPA/Report: 1987/10.. 552 p.]

ABSTRACT:

The paper points out some deficiencies and problems in evaluating consequences of excessive effort with single species and static models. The need for distinguishing between causes, symptoms and consequences of overfishing as a prerequisite for effective management is emphasized and several consequences of excessive effort, such as over-exploitation, over-capitalization, conflicts, vulnerability and reallocation costs are discussed. Finally, management implications are analyzed and suggestions are made to make use of more methodologies and analytical instruments, such as cost-benefit analysis, improved project evaluation techniques and programming models capable of accommodating important factors, which are generally omitted in analyses using traditional methods.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationer)]

AUTHOR [Anon]

TITLE [ICLARM-IFDR Multidisciplinary Study of Small-scale Fisheries of San Miguel Bay, Philippines]

SOURCE [ICLARM Newsletter., 1980., vol. 3, no. 2, pp. 14-16]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery development; fishermen; artisanal; fishery economics]

GEOGRAPHIC DESCRIPTORS [Philippines, San Miguel Bay]

ABSTRACT:

Recent attempts to improve the income levels of municipal fishermen in the Philippines have included a variety of financing schemes, the formation of associations and cooperatives and extension work by the Bureau of Fisheries and Aquatic Resources. Work currently being carried out in the San Miguel Bay Area is outlined.

SECTION [MARKETING]

AUTHOR [Anonuevo, M.V. and E.C. Zaragoza]

TITLE [Marketing Practices for New Shells, Ornamentals and Shellcraft., p.82-93]

SOURCE [Status of Mollusc Resources and Prospects for Development, Mangaser, M.A. and C.M. Lantican (eds.). Proceedings of the Seminar Workshop on Mollusc Resources and Prospects for Development, Ecotech Center, Cebu City, May 2-3, 1986., 136 p., Book Series No. 52, 1987]

PUBLISHER [Los Banos, Laguna. Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Bureau of Fisheries and Aquatic Resources]

ABSTRACT:

This project was conducted in Metro Manila, Cebu and Zamboanga from January 1981 to July 1982. Interviews and surveys were conducted among sea shell manufacturers, suppliers, traders and gatherers. From the producers/manufacturers, information on species utilized for manufacturers and other trade practices involved in pricing, processing, distribution and replenishment were obtained. Suppliers provided data on the species frequently gathered, their sources/origins, quantities gathered and peso values. The slack and peak months of these resources, the frequency of catch, distribution and commercial flow were determined.

Results showed that shells gatherers sell their product to either of the following: directly to consumers, to the manufacturers, processors and cleaners, and to government and other institutional users. Sometimes along this flow, local and retail outlets and export trading firms acted as middlemen in the buying process.

Different pricing strategies were used by the producers. There were no fluctuations in price levels of finished shell products. However, highly noticeable were the differences in price of the same materials from one area to another.

The local use of advertisements in the seashell industry was not widely practiced. Promotion was done in the foreign markets. The shells included

in this study were limited to indigenous molluscs used for shellcraft, shell collection and decorative purposes.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationer)]

AUTHOR [Aprieto, V.L. and R.A. Ganaden]

TITLE [Status of Philippine Tuna Fisheries]

SOURCE [paper presented at the National Conference of Fisheries Planning and Policy, 16-20 March 1987, Baguio City., 1987]

PUBLISHER [BFAR/UNDP/FAO]

ABSTRACT:

Tuna production increased from 9,000 MT in 1970 to a peak production of 261,000 MT in 1985, comprising 20% of the total marine fish catch that year. Canned and frozen tuna presently ranks as the number one fisheries export with a production of about 37,000 MT valued at P1.2 billion. The rapid growth of the fishery is attributed to the development of a highly efficient purse seine method using bamboo rafts or payao as fish aggregating device (FAO).

There are 21 species of tuna recorded in Philippine waters but only the yellowfin, big eye and skipjack have export value. The seas around Mindanao account for 58% of total tuna landings dominated by yellowfin and skipjack. In the commercial fisheries, purse seine, ring net and bagnet account for 97% of the total catch. In the municipal sector, 61% of the total catch is caught by handlines. Inadequate information on the biology, population structure and fishing effort of the tuna fishery makes it impossible at present to determine the extent of the relationships between the exploited stocks of tuna in Philippine waters and the closer "western" Pacific stocks. The Philippine waters are within the identified spawning areas of yellowfin and skipjack in the Western Pacific. Early juveniles from 20 cm and adults of tunas occur and are caught in most months of the year in all the fishing areas. Purse seine fishing surveys indicated that in the Moro Gulf, a 2 year old skipjacks (40-60 cm) and 1 year old yellowfin (40-60 cm) predominate. In the Sulu Sea both species are 1 year older, indicating that the Celebes Sea and the Sulu Sea are nursery areas. Both species move through and spend another year in the Sulu Sea and are abundant throughout the year.

While the use of the payac is causing the rapid removal of young juveniles of skipjack and yellowfin, it was only due to this efficient method that the Philippines was able to share competitively in the world market of this resource. There is a need for regional collaboration in tuna management in the Western Pacific. Government agencies should give high research priority to the tuna fisheries with sufficient funding and launch a strong training program for biologists on tuna stock assessment.

SECTION [PRODUCTION AND EFFICIENCY (Resource and Rent estimates situationers)]

AUTHOR [Aprieto, V.L. and R.A. Ganaden]

TITLE [Status of Philippine Tuna Fisheries]

SOURCE [Paper presented at the National Conference of Fisheries Planning and Policy, 16-20 March 1987, Baguio City., 1987]

PUBLISHER [BFAR/UNDP/FAO]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Aprieto, V.L. and R.A. Ganaden]

TITLE [Status of Philippine Tuna Fisheries]

SOURCE [Paper presented at the National Conference of Fisheries Planning and Policy, 16-20 March 1987, Baguio City., 1987]

PUBLISHER [BFAR/UNDP/FAO]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Aprieto, V.L.]

TITLE [Philippine Tuna Fisheries Management]

SOURCE [Fisheries Res. Journal, Philippines., 1982., vol. 7, no. 1., pp. 38-50]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [tuna fisheries, fishery management, fishery policy]

BIOLOGICAL DESCRIPTORS [Katsuwonus pelamis, Auxis thazard, Thunnus albacares]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

The biggest tuna producer in Southeast Asia, the Philippines, has a rapidly developing tuna industry dependent on four commercial species, namely, the skipjack (*Katsuwonus pelamis*), yellow fin (*Thunnus albacares*), eastern little tuna (*Euthynnus yaito*), and the frigate tuna (*Auxis thazard*). The resource maybe rapidly depleted by the highly efficient purse seine-bamboo raft method, catching considerable quantities of undersized juveniles often rejected in export market. Rapidly spreading from the Philippines to other islands in the west and central Pacific, the raft fishing method could strain the stocks unless conservation measures are instituted for a highly migratory and internationally shared resource. Although the Philippines has declared a 200-mile exclusive

economic zone, foreign fishing boats continue to poach major market species of tuna in these waters because of poor surveillance and law enforcement. Philippine fisheries policies are highly development-oriented but inadequate for management and conservation purposes. Management options for the local tuna fishery are given.

SECTION [MARKETING]

AUTHOR [Arancillo, C.N., A.V. Basilio and G.M. Papiol]
 TITLE [Tuna Production and Marketing System in Batangas]
 SOURCE [Agricultural Marketing Report Vol. VII, No. 23., 1985., 81 p.]
 PUBLISHER [BAECON]
 ABSTRACT:

The marketing system in Batangas is composed of 4 linkages, namely: producer --- broker --- retailer --- consumer; producer --- wholesaler --- wholesaler - retailer --- consumer; producer --- wholesaler --- retailer --- consumer and producer --- consumer. Transactions are usually done on a cash basis or consignment.

Analysis of the costs and returns show a positive gross return. The major marketing costs are transportation, market fee, ice and plastic wrapper. Tuna trading generated wider price margins as against other marine species.

To augment income, 11% of the respondents is involve in other jobs. Forty three percent of the total income is from fishery while 57% came from other jobs. Moreover, 69% of the total income of pure tuna fishermen came from sale of tuna, 31% from other species. Fishermen reported the following problems: (1) competition, (2) inadequate capital, (3) unfavorable weather conditions, (4) water pollution, (5) inadequate capacity of fishing gears, (8) depleting fish supply and (9) poor health on the fishermen's part. Marketing problems are high transportation costs, limited storage spaces and robbery.

The industry has export potentials but fishermen are hesitant to enter the export market because of lack of capital, inadequate export knowledge, no established contacts with exporters, and presence of local buyers willing to absorb supply. The study recommends the establishment of a fishing association which would free fishermen from their dependency on market outlets for prices. Moreover, to increase their income, modern fishing techniques and technologies should be introduced and taught to these fishermen. Government should also find ways to make loans more available and accessible to fishermen.

SECTION [SOCIOECONOMIC CONDITION (Industry Situationer)]

AUTHOR [Ardales, V.B. and F.P. David]
 TITLE [The Poverty Conditions of Artisanal Fishermen in Iloilo Province, p. 3-66]
 SOURCE [Faces of Philippine Poverty: Four cases from the Visayas (eds. R.G. Abad; R.V. Cedelina; V. Lopez-Gonzaga)., 1986., 229 p.]

PUBLISHER [Visayas research Consortium, Philippine Social Science Council, Inc.,
Quezon City]

ABSTRACT:

The study documents the nature and extent of poverty among the artisanal fishermen in Iloilo Province. The principal research techniques used were the sample survey, non-participant observation, and interviews with key informants in selected communities. Descriptive statistical measures were used for describing the characteristics of the respondents, households and communities. In making comparisons of household incomes by different fishing seasons, the z-test was used to determine the significance of the difference between means, medians or proportions. No multivariate statistical procedures were applied.

Findings include per capita income, factors contributing to poverty, perceptions, aspirations, and survival strategies. Studies and action programmes are recommended.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Bailey, C.]

TITLE [Small-scale Fisheries of San Miguel Bay, Philippines: Occupational and Geographic Mobility.]

SOURCE [ICLARM Technical Reports 10., 1982., 57 p., IFDR/CF/UPC, Quezon City]

PUBLISHER [ICLARM, Manila and UNU, Tokyo, Japan]

ABSTRACT:

The possibility of raising incomes and standards of living among small-scale fishermen in much of the developing world is constrained by the limited nature of their fishery resources. In this report existing patterns and future potentials for occupational and geographic mobility among small-scale fishermen of San Miguel Bay, Philippines, were examined to determine whether such mobility has led or is likely to lead to a reduction of surplus and incomes of those fishermen who remain.

Existing alternatives to fishing within the local economy was examined and found to offer the only limited potential for absorbing labor from the fisheries sector. A high degree of stated willingness to change both occupation and residence was found to exist among fishermen regardless of age, educational attainment, ownership of house or land, and type of fisherman (e.g. owner-operator crewman).

Examination of census data at the community (barangay) level for the period 1939-1980 using census-survival techniques indicated substantial net-out migration from the San Miguel Bay Area. Nonetheless, in absolute terms, number of fishermen have increased during this period, contributing to heavy pressure on the Bay's marine resources. Equally significant in terms of fishing effort were trawlers, which began operating within the Bay during the 1970's. Owned by a small number of families, these trawlers employed 10% of the bay's fishermen but accounted for 47% of the total catch in 1980.

The issue of competition between small-scale fishermen and trawler operators in San Miguel Bay was discussed. The appropriateness of displacing

small-scale fishermen from the traditional fishing grounds was questioned, especially where alternative employment opportunities are limited, as in the case in San Miguel Bay Area. In the long term the encouragement of economic alternatives to fishing was found to be essential, but in the short term, efforts to improve conditions among small-scale fishermen might more effectively be based on better enforcement of current management regulations, which are designed to limit competition between small-scale fishermen and trawlers.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Bailey, C. (ed.)]

TITLE [The Fisherman's family: Economic Roles of Women and Children]

SOURCE [Small-scale Fisheries of San Miguel Bay, Philippines: Social Aspects of production and marketing., ICLARM Technical Report., no. 9, 1982, pp. 42-50]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [women; sociological aspects; artisanal fishing; fishery economics]

GEOGRAPHIC DESCRIPTORS [Philippines, San Miguel Bay]

OTHER DESCRIPTORS [children]

ABSTRACT:

Productive roles of women and children in the small-scale fisheries of San Miguel Bay, Philippines, were divided into those which generate cash income and those which do not. Economic values were placed on the latter category which were essential for the material well-being of the household, the primary productive unit. Non-quantifiable but important roles performed by women were as manager of family finances, in determining daily consumption patterns and in influencing investment decisions. In addition, a wide range of income-earning occupations, mostly related to fisheries, were found to exist for women. The contribution of adolescent males to household income as fishermen, in portage or other fishery-related occupations is discussed. (Produced in cooperation with: International Fisheries Development and Research and the International Center for Living Aquatic Resources Management, Manila, Philippines), and the United Nations Univ., Tokyo (Japan).

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Bailey, C. (ed.)]

TITLE [Small-scale Fisheries of San Miguel Bay, Philippines: Social Aspects of Production and Marketing]

SOURCE [ICLARM Technical Report, no. 9, Institute of Fisheries Development and Research, Quezon City, Philippines, 1982, 57 p.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, sociological aspects, fisheries,

processing fishery products, marketing]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]

OTHER DESCRIPTORS [women, children]

ABSTRACT:

This technical report analyses the social linkages among fishing communities San Miguel Bay, attitudes toward fish production, processing and marketing, economic role of women and children, variations in sharing system by gear types, and socioeconomic aspects of the marketing system. It represents data gathered primarily from interviews with 641 fishing households, supplemented participant observation conducted over approximately a two-year period, 1979-1981.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Bailey, C. (ed.)]

TITLE [Systems of Sharing and Patterns of Ownership]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Social Aspects of production and Marketing., ICLARM Technical Report., no. 9, 1982., pp. 25-41]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishing gear, fishery economics]

GEOGRAPHIC DESCRIPTORS [Philippines, San Miguel Bay]

OTHER DESCRIPTORS [ownership, sharing]

ABSTRACT:

Sharing systems and patterns of ownership of several common small-scale gears are analyzed and compared with those of the small and medium trawlers operating in San Miguel Bay, Philippines. Significant differences between these two groups were found in concentration of ownership, presence of non-economic social relationships between owners and crewmen, and flexibility of sharing arrangements. These differences are discussed in terms of existing legal definitions of "municipal" and "commercial" fisheries.

SECTION [MARKETING]

AUTHOR [Bailey, C.]

TITLE [The Seasonality of Fishing, Marketing and Processing]

SOURCE [Small-scale Fisheries of San Miguel Bay, Philippines: Social Aspects of Production and Marketing., ICLARM Technical Report., no. 9., 1982., pp. 14-24]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [seasonality, artisanal fishing, marketing, processing fishery products, fishery economics]

GEOGRAPHIC DESCRIPTORS [Philippines, San Miguel Bay]

ABSTRACT:

The seasonality of the San Miguel Bay, Philippines fishery is

discussed in relation to weather patterns and the presence of hills and mountains which shelter different parts of the Bay during the two monsoonal seasons, allowing for year-round fishing. The seasonal nature of fishing, nonetheless, commonly makes necessary a shift from one gear to another to take advantage of the various fishing grounds and fisheries. This in turn affects marketing patterns and the activities of fish processors. Marketing relationships and constraints are related to community size, number of buyers present, and availability of road transportation. The seasonal role of processors is assessed relative to weather conditions, availability of fish, and impact on price levels during seasons of peak supply.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Bailey, C.]

TITLE [Social Consequences of Excess Fishing Effort, pp. 170-181.]

SOURCE [Indo-Pacific Fishery Commission. Papers presented at the symposium on the Exploitation and Management of Marine Fishery resources in Southeast Asia held in conjunction with the Twenty-Second Session of the Indo-Pacific Fishery Commission, Darwin, Australia, 16-26 February 1987. RAPA/Report: 1987/10., 552 p.]

ABSTRACT:

Levels of fishing effort are defined as being excessive where they result in depletion of commercially valuable stocks and so thereafter sustainable harvests. In many parts of Southeast Asia, this threat has been realized by the rapid expansion of commercial fisheries and the consequent increase in fishing effort. Southeast Asian fisheries are described as having dualistic structure with distinct small-scale and large-scale subsectors. Competition and conflict between these subsectors is widespread and exacerbates the negative social consequences of excessive fishing effort. These include dissipation of resource rents, gear conflicts leading to broader social conflict, increased use of destructive fishing techniques, changes in the food supply and distribution channels (with disproportionate negative effects rural populations), and increased concentration of economic power within the fisheries sector. Further, excessive fishing effort reduces incomes and standards of living for the majority of fishermen and undermines community-based distributive and resource management mechanisms. The fundamental problems of fisheries management are inherently political, entailing issues of resource allocation and distributive equity. These problems are complicated by the role of fisheries as a social safety valve for the landless and the unemployed. As such, fisheries management can not be divorced from broader problems of Southeast Asian nations and are only solvable with this larger context.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Bailey, C. (ed.)]
 TITLE [Small-scale Fisheries of San Miguel Bay, Philippines: Social Aspects of Production and Marketing]
 SOURCE [ICLARM Technical Report, no. 9, Institute of Fisheries Development and Research, Quezon City, Philippines, 1982, 57 p.]
 SUBJECT DESCRIPTORS [artisanal fishing, sociological aspects, fishermen, processing fishery products, marketing]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]
 OTHER DESCRIPTORS [women, children]
 ABSTRACT:
 * see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [MARKETING]

AUTHOR [Bailey, C. (ed.)]
 TITLE [Small-scale Fisheries of San Miguel Bay, Philippines, Social Aspects of Production and Marketing]
 SOURCE [ICLARM Technical Report, no. 9, Institute of Fisheries Development and Research, Quezon City, Philippines, 1982, 57 p.]
 SUBJECT DESCRIPTORS [artisanal fishing, sociological aspects, fishermen, processing fishery products, marketing]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]
 OTHER DESCRIPTORS [women, children]
 ABSTRACT:
 * see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Baum, G.A. and J.A. Maynard]
 TITLE [Tobuan/Sual: A Socio-economic Study.]
 SOURCE [SCS/76/WP/22., 1976., 44 p.]
 PUBLISHER [South China sea Fisheries Development and Coordinating Programme, Manila, Philippines]
 ABSTRACT:
 The study on the adjacent communities of Tobuan and Sual, Pangasinan Province along the southern shoreline of Lingayen Gulf is the first of the five similar studies conducted in selected areas of the Philippines by the SCSP in close collaboration with BFAR. The purpose of these studies is to provide the

necessary socio-economic background information for the formulation of an action-oriented project designed to meet some of the specific needs and problems of the artisanal fisheries sector, known locally as municipal fisheries.

A 20% random sample survey of fishing households in Topuan/Sual gathered data on selected social characteristics of the interviewers and their households, economic conditions, attitudes and intentions. There is no accurate assessment of the potential fishery resource in the Gulf, but it appears that available resources are fairly substantial based on the production records of commercial vessels. A more immediate approach to develop this area would be to focus on providing opportunities for municipal fishermen to increase their present income and attempt to narrow the productivity gap between the municipal and commercial fishing sectors. Consideration should be given to limiting the present rapid growth rate of the commercial fleet now operating in the Gulf, or perhaps to further limit their areas of operation to the outer areas of the Gulf, leaving the resources of the inner gulf for municipal fisheries development. The portion of the catch sold to fish dealers brings a price of approximately 40% of the urban retail value, a fact that indicates the desirability of a cooperative marketing system to substantially increase earnings of municipal fishermen. The DBP loan program has shown no considerable catch increases with the advent of mechanization and is considered more of a grant or a temporary form of assistance.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Baum, G.A. and J.A. Maynard]

TITLE [Panigayan, Lampinigan, Baluk-baluk, Managal: A Socio-economic Study.]

SOURCE [SCS/76/WP/23., 1976., 62 p.]

PUBLISHER [South China Fisheries Development and coordinating Programme, Manila, Philippines]

ABSTRACT:

This case study of four fishing communities north and northwest of Basilan Island is the second of five similar studies conducted in selected areas of the Philippines by the SCSP in close collaboration with BFAR. The purpose of these studies is to provide the necessary socio-economic background information for the formulation of broad-based scale prospects designed to meet some of the specific needs and problems of the artisanal fisheries sector, known locally as municipal fisheries. At each of the four barrios a 10% random sample of the population was taken, except at Managal where 20% sample was interviewed due to the small number of families there. Data gathered include selected social characteristics of the interviewers and their households, economic conditions, attitudes and intentions.

Obvious differences in the living and working conditions were observed among the four barrios, with a clear decrease from Panigayan and Lampigan in relation to Baluk-baluk and Managal at the other end, mainly as a result of their distance from Isabela City as the socio-economic center of the area. One of the possible steps to soften the differences would be to make access to goods and services needed easier for the population in places distant from the center. A future pilot programme should make utmost use of the Basilan Fishing Association (BFA) as a pivot point for all efforts directed towards an improvement of the municipal fisheries sector. However, the unfavorable peace

and order situation in the area will continue to be a constraint to any major project planning.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationer)]

AUTHOR [Baum, G.A. and J.A. Maynard]

TITLE [Salay Municipality: A Socio-economic Study.]

SOURCE [SCS/76/WP/29., 1976., 47 p.]

PUBLISHER [South China sea Fisheries Development and Coordinating programme,
Manila, Philippines]

ABSTRACT:

This case study on a rural fishing population in Misamis Oriental (Mindanao) is the third of the five similar studies conducted in selected areas in the Philippines by the SCSP in close collaboration with BFAR. The purpose of these studies is to provide the necessary socio-economic background information for the formulation of broad-based scale projects designed to meet some of the specific needs and problems of the artisanal fisheries sector, known locally as municipal fisheries. The study concentrated on the 7 coastal barrios of the municipality of Salay where a 15% random sample of fishermen's households was taken in each barrio and interviews with a 6-page standardized questionnaire were carried through. Data gathered include selected social characteristics of the interviews and their households, economic conditions, attitudes and intentions.

The municipal fisheries sector plays a very minor role in the overall economic and social structure in Salay, the municipality having primarily dependent upon agriculture. Full-time fishermen realize a comparatively good income of over P60,000 annually, which seems to be directly related to their relatively high production effort of over 220 fishing days per year. The retail market price of fish in the community is at the same level of urban market prices but the local fishermen are not the benefactors of the high prices since fish dealers pay the same landed prices regardless of market destination. The local and nearby urban fish markets, particularly that in Cagayan de Oro, can readily absorb any reasonable increase in fish production and landings. Expansion of the salay municipal fishing fleet and a cooperative wholesale/retail market should provide benefits for both the fishermen and the people in the community.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationer)]

AUTHOR [Baum, G.A. and J.A. Maynard]

TITLE [Bayawan Municipality: A Socio-economic Study and Development Proposal]

SOURCE [SCS/76/WP/42., 1976., 67 p.]

PUBLISHER [South China Sea Fisheries Development and Coordinating Programme,
Manila, Philippines]

ABSTRACT:

This case study on a rural fishing population in Negros Oriental is the fifth of five similar studies being conducted in selected areas of the Philippines by the SCSP in close collaboration with BFAR. The purpose of these studies is to provide the necessary socio-economic background information for the formulation of broad-based scale projects designed to meet some of the specific needs and problems of the artisanal fisheries sector, known locally as municipal fisheries.

The study concentrated on four of the five coastal places of Bayawan Municipality, i.e. Villareal, Poblacion (the center of the Municipality), Banga and Malabugas. Pangatban, seven km. away from poblacion and with a reportedly small fishermen's population was not covered. In each of the four places mentioned, a 10% sample was drawn, although during the actual field work the percentage was most probable higher.

Data collected included selected social characteristics of the interviewees and their households, economic conditions, attitudes and intentions. Fishing does not relate to any important economic factor in this community of over 60,000 people considering that both full-time and part-time fishermen and their households would only account for about 1,400 persons, about 2.3% of the total population. Total gross income from sale of fish oil at landed prices would be approximately P1.9 million.

The marketing of catch for the monetary benefit of the fishermen could be improved with the formation of a collective marketing system. There should be easy marketing opportunities here considering that the production falls far short of supplying local market requirements. Any catch surplus to local community demand could be easily be disposed of in Dumaguete, a distance of 102 km. by national highway, where the supply falls short of the market demand during 9 months of the year.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Baum, G.A. and J.A. Maynard]

TITLE [Coron/Tagumpay: A Socio-economic Study and Development Proposal]

SOURCE [SCS/76/WP/33., 1976., 112 p.]

PUBLISHER [South China Sea Fisheries Development and Coordinating Programme, Manila, Philippines]

ABSTRACT:

This case study in two fishing communities in the Calamian Group, Palawan conducted in selected areas of the Philippines by the SCSP in close collaboration with BFAR. The purpose of these studies is to provide the necessary socio-economic background information for the formulation of broad-based scale projects designed to meet some of the specific needs and problems of the artisanal fisheries sector, known locally as municipal fisheries.

The survey covers the rural fishing populations of Coron (Poblacion), center of the municipality of the same name, as well as Barrio Tagumpay, closely linked to the poblacion geographically as well as socio-economically. In the sampling procedure, the fishing population of each place was treated as individual entity. Of the fishing population of Tagumpay a 12.1% sample was

taken.

In Coron, the sample covered around 30% due to the small entity there. Data gathered include selected social characteristics of the interviewees and their households, economic conditions, attitudes and intentions.

The survey communities are the principal population centers of the Calamian group of islands where fishing is by far the principal industry. The fisheries resources appear to be abundant here and the development of a fisheries industry can be accompanied as a basis for regional development. The study indicates an apparent lack of social cohesion and community pride among the local citizens. This condition of community apathy could be overcome through the creation of a community enterprise which could cause tangible benefits to inure directly to the majority of the citizens. The study concludes that this project area possesses all the basic and necessary resources, human and natural, for the commercial development of an integrated fisheries industry, considering that there are no other natural possibilities for the creation of an industrial or commercial base for the local economy.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Baluyot, E.A.]

TITLE [Planning for Inland Fisheries under Constraints from other Uses of Land and Water Resources. General Considerations and the Philippines]

SOURCE [FAO, Fisheries Circular, no. 798., 1986., 44 pp.]

ABSTRACT:

This information is directed especially to engineers, planners and decision makers, and also to fisheries specialists interested in optimizing fisheries under constraints from other uses of lands and water resources. Its purpose is to assist in reaching correct decisions in discussions between various specialists during planning, design, implementation and management phases of major river basin development projects with fisheries potential.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Belnas, A.L.]

TITLE [A Preliminary Study of the Shrimp Catches in the Visayan Sea, San Miguel Bay and Manila Bay]

SOURCE [Report of the workshop on the biology and resources of Penaeid Shrimps in the South China Sea Area., Part 1, 30 June - 5 July, Kota Kinabulu, Sabah, Malaysia., 1980., pp. 86-92]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [shellfish catch statistics, fishery data, shrimp fisheries]

BIOLOGICAL DESCRIPTORS [Penaeids]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]
 ABSTRACT:

This paper analyses the data gathered for a study on the stock assessment of the fishery resources in the Visayan Sea, San Miguel and Manila Bay.

SECTION [SOCIO-ECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [BFAR/RFTC Project Coordinating Staff]
 TITLE [A baseline study report on small-scale fishermen, fishfarmers, fish processors and fishing communities]
 SOURCE [1981., 288 p.]
 PUBLISHER [BFAR/EDPITAF]
 ABSTRACT:

The purpose of this study is to assess the socio-economic status, level of technology and productivity, technical assistance and training needs of individual small-scale fishermen, fishfarmers and fish processors. Likewise, a review of the socio-economic conditions of fishing communities was made. Study includes fishing municipalities, municipal fishermen, fish processors, and small-scale fish farmers.

Study conducted in 2 levels, i.e. fishing community (barangay) and individual small-scale fishermen, fish farmers and fish processors. Study on fishing community would include assessment of socio-economic status, fishery resources, facilities, infrastructure, marketing and distribution system. Study on individual small-scale fisherman, fish farmer, fish processor would include socio-economic status, description of production and marketing techniques, cost and return of production, technical assistance and training needs.

All regions of the country were included in the study. The study concludes with a list of recommendation to improve socio-economic conditions of the fishing community.

SECTION [SOCIO-ECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [BFAR/SCSP]
 TITLE [Socio-economic and marketing study of municipal fishing households]
 SOURCE [BFAR/SCS/83/WP/121., 1983., 94 p.]
 PUBLISHER [Bayaan, Negros Oriental, Philippines]
 ABSTRACT:

This study conducted in November 1982 by the Bureau of Fisheries and Aquatic Resources (BFAR) is a follow-up of the socio-economic survey in 1976 by Gerhard A. Baum and John A. Maynard of South China Sea Fisheries Development and Coordinating Programme (SCSP) in collaboration with BFAR. The present study

seeks to provide updated baseline information for reference in the implementation and future assessment of the small-scale Fisheries Development Project for Bayawan, Negros Oriental and as a model for any municipal fisheries development in the future. It covers the socio-economic profile of municipal fishermen and fry gatherers and their households, costs and returns of fishing operations and fish marketing practices.

The study indicates that compare to 1976, developments in Bayawan includes increased infrastructure, health facilities and electrification; more household heads are satisfied with their own living conditions and with the living conditions of the community as a whole; fishing households tend to be smaller with higher per capita income; and there are indications of greater willingness to undertake collective efforts to bring about change as evidenced by higher percentage of membership in social, civic and other organizations. The system for sharing catch from fishing operations appears to be non-profit oriented. There is no significant difference in income between owner-operated and non-owner operated motorized bancas. Numerous fishermen receive unfavourable returns from their catch on account of price manipulation, price variability and low price. In addition, there is a lack of cold storage facilities and capital in marketing fish catch.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Brucelas, M.R.]

TITLE [Productivity and Profitability of Trawlers and Purse Seiners in Southeast Asia, p. 253-260.]

SOURCE [Economics of aquaculture, sea-fishing and coastal resource use in Asia..., 1979]

ABSTRACT:

The paper provides information on the productivity and costs and earnings of different sizes of fishing vessels in selected fishing ports in Singapore, Philippines and Thailand in 1976.

On the productivity of trawlers in the Philippines, Class A (100 GT and above) had the highest catch per year. Based on catch per fishing day, Class A also obtained the highest catch. Comparing trawl Class B (50-100 GT) and Class C (30-50 GT) in the Philippines, the former had the highest catch per day.

For purse seines, productivity per fishing day of Class A was highest in the Philippines followed by Classes B and D.

SECTION [MARKETING]

AUTHOR [Bungcayao, F.L. and T.C. Valdellon]

TITLE [Fish Retailing in Metro Manila Markets]

SOURCE [Agricultural Marketing Report Vol. VIII, No. 20., 1986., 58 p.]

PUBLISHER [BAECON]

ABSTRACT:

Average marketing cost and net income of the top marine species ranged from P 0.43 to P 2.33 per kg and P 0.86 to P 6.09 per kg, respectively. Retailers of hasa-hasa incurred the highest marketing cost of P 2.33 per kg while those of matangbaka incurred only P 0.43 per kg.

Retailers who traded lapu-lapu received the highest margin of P 6.09. The smallest net margin was P 0.86 for hasa-hasa. Bisugo retail traders experienced a net loss of P 1.02 per kg. Retailers preferred assorted fish supplies and picked them up from their sources. Cash, credit and consignment were the prevailing terms of payment. Prices were settled by negotiating with fish suppliers.

Selling prices were based on procurement costs and prevailing market prices in their place of business. Spoilage was not a problem because retailers easily disposed of their fish suppliers.

Retailers complained of slack demand for fish and increasing operation costs. Capitalization was also a problem.

Analysis of the costs and returns in retailing indicate a positive net return. Also, retailers, suppliers and consumers are already used to the existing marketing system and there is no immediate need to alter the present marketing system. It is suggested therefore that policies and programs that will introduce changes in current practices be carefully studied.

The slack in demand during certain period of the year, high cost of production and insufficient capital did not discourage retailers in continuing their business activities. This suggest that fish retailing is a major source of income. Alternative employment is not a solution. Information dissemination through price bulletin and radio broadcast of wholesale prices in the trading centers will make fish retailers aware of the the present market conditions. Government should also look into the financial status of retailers directly selling to consumers. With sufficient capitalization, retailers will be able to have a broader choice of the species they will purchase for resale to the consumers. This will also help stabilize prices for the benefit of the consumers.

SECTION [MARKETING]

AUTHOR [Bungcayao, F.L., L.N. Cea and M.S. Lizarondo]

TITLE [Production and Marketing of Tuna in Basilan]

SOURCE [Agricultural Marketing Report Vol. VII, No. 21., 1985., 62 p.]

PUBLISHER [BAECON]

ABSTRACT:

This study is part of a series of provincial studies conducted by the bureau. It describes and analyzes the production and marketing practices of tuna in Basilan.

Findings of the study includes the following:

- 1) 62% of tuna catch in Basilan were retained in the province, 28% are sold in Zamboanga City. The shortest route is through the producer then to the retailer and finally to the consumer. Another route includes the broker which links the retailer to the producer.

2) Fishermen did not consider transportation a problem because of the proximity of the landing area to the trading center. In addition, the fishermen did not find the need for storage facilities since their products are readily sold.

3) Fishermen netted P 4.89/kg for tuna and P5.54 for non-tuna species.

4) Producers are price-takers. On the contrary, traders were known to be always bargaining for their purchase price.

5) Tuna fishermen had no interest in exports because of insufficiency in capital, lack of knowledge of export transactions and small catch volume. Peace and order condition hinder fishing activities.

The study concludes with the following recommendations:

1) Although transportation was not cited as a major marketing problem, there is still a need to designate landing areas for fishermen.

2) The presence of information regarding marketing linkages enables the possibility of conducting future studies to formulate better linkages.

3) Although tuna fishing is considered a profitable business, fishermen gained more income from non-tuna species mainly because of the presence of stiff competition. It is better therefore to promote the uses of tuna to increase demand and profit of fishfarmers.

4) Producers were found to be price-takers. This would not be the case if there is an association or a marketing group that will help strengthen the bargaining power of the fishermen.

SECTION [RESOURCE ADEQUACY]

AUTHOR [Cabrido, Jr. Candido]

TITLE [Methods for determining the optimum population supporting capacity of ecosystems]

SOURCE [Condensed report of a resource study funded by the Population/Development Planning and Research Project (PDPR) of the National Economic and Development Authority (NEDA). June 1989, mimeographed.]

ABSTRACT:

The population carrying capacity of the province of Palawan is assessed using these methods: (a) real demand, which is based on nutritional requirements of the population; (b) effective demand, which is based on actual per capita consumption of food products; and (c) income subsistence needs, which is based on poverty threshold and family consumption levels.

A modified version of the UN-FAO AEE model is employed in assessing potential production of rice and corn in upland and lowland areas, goats and cattle from extensive grazed rangeland, and capture fisheries from marine and freshwater sources. Among the findings are:

(1) Existing upland population of Palawan would not be able to subsist if they were to depend mainly on their principal crop in view of the low yield of these crops (rice and corn).

(2) A thorough evaluation of land resources is necessary prior to their distribution and policy guidelines to this effect should immediately be formulated. For example, the results of the study indicate that the retention limit imposed by the Comprehensive Agrarian Reform Program (CARP) may incidentally create social inequities: the three-hectare ceiling set for farmer-beneficiaries may not work at all in the case of uplands and rangeland

specially those in the sub-marginal state. Thus, lowland beneficiaries receiving 3 hectares of irrigated or rainfed land will be much better off than those receiving the same size but located in the uplands or the rangeland. This circumstantial distortion in land distribution should be prevented through rationalized implementation of the retention ceiling.

(3) The income population carrying capacity of lake and river ecosystems of Palawan province is inadequate to sustain its present population. Overall, the marine aquatic ecosystem of Palawan has vast potential for supporting its projected population.

(4) The accuracy of the results of the income population carrying capacity assessment is greatly dependent on the accuracy of data on farm budget. Thus, future replication of this study should consider the generation of primary data on farm budget specific to the ecosystems concerned.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Caddy, J.F. (ed.)]

TITLE [Cephalopod Resources in the Indo-Pacific Region]

SOURCE [Advances in assessment of World Cephalopod Resources., FAO Fish. Tech. PAP/FAO, Doc. Tech. PECHES/FAO, Doc. Tec. PESCA., no.231, 1983., pp. 264-305]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [cephalopod fisheries]

BIOLOGICAL DESCRIPTORS [Cephalopoda]

GEOGRAPHIC DESCRIPTORS [Australia Coasts; ISW, Bengal Bay; ISW, Arabian Sea; ISEW, Philippines; ISEW, Java Sea; I, Indo-Pacific China Sea; INW, Yellow Sea; ISEW, East China Sea; ISEW, South China Sea]

OTHER DESCRIPTORS [stock assessment, [potential yield]

ABSTRACT:

In this study the remaining areas have been divided into seven sub-areas as the nature of the resources and the state of exploitation on them differ greatly by localities, namely, 1) Yellow Sea and East China Sea, 2) waters around the Philippines, 3) South China Sea, 4) Java Sea to northern Arafura Sea, 5) waters around Australia, 6) Bay of Bengal and 7) eastern Arabian Sea. The commercial fishing currently directed toward cephalopods in each area has generally been small in comparison to the vast extent of the possible fishing grounds (both horizontally and vertically) and supposedly large potential yields there. The potential yield of the neritic cephalopods has been roughly estimated to be about 1.1-1.4 million tons from the entire region compared with the current catch of about 0.3 million tons. Some problems involved in the future development of the cephalopod fishery are discussed specifically in connection with the nature of small-scale fisheries in the region.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates)]

AUTHOR [Chong, K.C., Smith, I.R., Lizarondo, M.S.]
 TITLE [Economics of the Philippine Milkfish Resource System]
 SOURCE [UNU Publications, Tokyo, Japan, 1983., 66 pp]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [fishery economics, books]
 BIOLOGICAL DESCRIPTORS [Chanos-chanos]
 GEOGRAPHIC DESCRIPTORS [Philippines]

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Cortes, A.B. and Recio, C.V.]
 TITLE [Socio-economic Strategy for Fisheries Development in the Philippines]
 SOURCE [Report of the seminar on fishery technology education, July 11-August 1, 1979., (nd)., pp. 98-103]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [fishery development, fishery economics, sociological aspects, marine fisheries, aquaculture development]
 GEOGRAPHIC DESCRIPTORS [Philippines]
 ABSTRACT:
 This country report presents the socio-economic strategy for fisheries development in the Philippines.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Cortes, A.B. and Recio, C.V.]
 TITLE [Socioeconomic Strategy for Fisheries Development in the Philippines]
 SOURCE [Report of the Seminar on Fishery Technology Education, July 11-August 1, 1979., (nd)., pp. 98-103]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [fishery development, fishery economics, sociological aspects, marine fisheries, aquaculture development]
 GEOGRAPHIC DESCRIPTORS [Philippines]
 ABSTRACT:
 * see previous entry

SECTION [SOCIOECONOMIC CONDITIONS]

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Cruz, A.V.]

TITLE [An Improved Method to Conduct Project evaluation in a fishery]

SOURCE [Thesis, Master in Applied Business Economics, Center for Research and Communication., 1988., 164 p.]

ABSTRACT:

The main objective of this thesis is to improve the application of the existing techniques for conducting financial and economic evaluation when applied in a fishery. In order to attain this, the following secondary objectives, must be achieved first:

- a) analyze existing methodologies for financial/economic appraisal in a fishery and determine if these methods accommodate the spatial characteristics of a fishery, notably its "open access" and "limited yields" character;
- b) apply the "traditional" method to the trawler fleet in Penang, Malaysia and exemplify some of its shortcomings;
- c) determine the problems encountered when using traditional methods and use it as a basis for improvement;
- d) suggest improvements to the application of the present technique and apply it to the same case; and
- e) compare and derive conclusions from the comparison of the traditional and improved technique.

Applying both traditional and improved techniques in the case of trawling in Penang, Malaysia, the study concluded that 1) the traditional technique overestimates the profitability of a fishery project; 2) annual costs and revenues are affected by the level of total effort in the fishery, a condition which has been considered by the improved technique, thus providing a more realistic approach to project evaluation in a fishery.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Cruz, W.D.]

TITLE [Technical and Institutional Change in Renewable Resource Development with Application for Traditional Fisheries]

SOURCE [Diss. Abst. Int. Pt. A - Humanities and Social Science., Vol. 43, no. 11 1983., 322 p.]

SUBJECT DESCRIPTORS [sociological aspects, technology transfer, developing countries]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]

ABSTRACT:

The crucial role of renewable resources in food production and the disappointing results that have come from primarily technical oriented programs in the socioeconomic context of traditional communities point to the need to develop an analytical approach that can address both institutional and technical issues and the unique problems arising from change in the subsistent or transitional economy. Toward this end, this research develops a general model of institutional and technical change and a specific model of resource use in transitional economy. These are then used in the investigation of a traditional

fishing ground, San Miguel Bay in Camarines Sur of the Philippines.

SECTION [MARKETING]

AUTHOR [Cuyos, N.A. and A. Spoehr]

TITLE [The Fish Supply of Cebu City: a Study of Two Wholesale Markets]

SOURCE [Philippine Quarterly of Culture and Society, 4., 1976., pp. 160-198.,
University of San Carlos, Cebu City]

ABSTRACT:

- 1) The wholesale market of fresh fish: Pasil Market
 - physical setting
 - service areas of fish supply
 - how fish is transported to Pasil Market
 - routine of marketplace
 - factors affecting the fish supply
 - brokers in the market
 - personnel of a broker's tarima (space, market facilities, physical improvements)
 - brokers and the suki relationship
 - brokers and kinds of suppliers
 - the broker as sales agent
 - loans by brokers to suki suppliers
 - brokers and kind of buyers
 - suki vendors (pasaheros) and loans extended to them
 - prices
 - bargaining and the suki relationship
 - volume specialization and diversification
 - broker's risks and gains
- 2) The wholesale marketing of preserved fish: Taboan Market
 - history and physical characteristics
 - bodega personnel
 - routine of the marketplace
 - source areas of the fish supply
 - kinds of fish sold
 - traders and their buyers
 - prices

SECTION [PRODUCTION AND EFFICIENCY (Resource and Rent Estimates Situationers)]

AUTHOR [Dalzell, P., P. Corpuz, and R. Ganaden and D. Pauly.]

TITLE [Estimation of Maximum Economic Rent from the Philippine Small Pelagic Fisheries]

SOURCE [BFAR Technical Paper Series, Vol. X, No. 3., 1987., 23 p.]

PUBLISHER [Bureau of Fisheries and Aquatic resources, Quezon City, Philippines
and International Center for Living Aquatic Resources Management,
Manila, Philippines]

ABSTRACT:

A method is presented whereby the fishing power of commercial fishing fleets and municipal fishing vessels can be standardized with respect to landed catches of small pelagic fishes in the Philippines. Fishing power was expressed as adjusted fleet horsepower (hp) and averaged over two years to account for the average life span of small pelagic fishes. The corresponding plot of landed catch vs. fishing power was used to obtain a countrywide Philippine small pelagic fishes of 544,000 tonnes at an optimal fishing pressure of 250,000 hp. The yield curve indicates that presently, the Philippine small pelagic fisheries are heavily overfished and that since 1973, small pelagic landings have shown a declining trend. The maximum annual yield above costs was estimated to be about 500,000 t at a fishing effort of 155,000 hp or 35% of the present effort level. At current fish values, the maximum economic rent from the Philippine small pelagic fisheries would be about US\$ 250 million.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Dalzell, P. and R.A. Ganaden]

TITLE [A Review of the Fisheries for Small Pelagic Fishes in Philippine Waters]

SOURCE [BFAR Technical paper Series, Vol. X, No. 1., 1987., 58 p.]

PUBLISHER [Bureau of Fisheries and Aquatic Resources, Quezon City, Philippines
and International Center for Living Aquatic Resources Management,
Manila, Philippines]

ABSTRACT:

A review is presented of the fisheries for small pelagic fishes in the Philippines which represent a total production of about 500,000 t/yr worth up to US\$ 250 million/yr. Data on catches and landings of these species are summarized on a temporal and geographic basis. The relative importance of the different species groupings to the total catch of small pelagics is determined and recent fluctuations of the annual catch of these groupings are examined. The contributions by different fishing gears to the total small pelagic catch are given and some deficiencies in the present recording system are discussed, specially with respect to fishing effort. Long-term catch data from 1948 to 1984 from commercial fishing operations suggest that fishing effort for small pelagic fish is presently well beyond the level generating maximum sustainable yield. Summaries are presented of the biology and ecology of the various small pelagic fishes of the Philippines, covering the families Engraulidae, Clupeidae, Scombridae, Caengidae, and some lesser groups such as Caesionidae.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Dalzell, P., and R. Ganaden]

TITLE [The status of Philippine small pelagic fish stocks]

SOURCE [Paper presented at the National Conference on Fisheries Planning and Policy, 16-20 March 1987, Baguio City., 1987]

PUBLISHER [8FAR/UNDP/FAO]

ABSTRACT:

A review is presented of the status of Philippine small pelagic fisheries, landings of small pelagic fishes which consist primarily of roundscabs, sardines and anchovies, currently amount to about 500,000 t/yr. Virtually, all small pelagic fish are caught between Central Luzon and Southern Mindanao. There is a diversity of gears for catching small pelagic fishes but 60% of the entire landings are accounted for by purse seines, bag nets and gill nets. Time series of landings and nominal fishing effort in the commercial small pelagic fisheries indicated that these stocks are overfished. A method is presented to standardize fishing effort between different vessels and gear types that also includes the effect of carrier vessels on fleet fishing power. The relationship between catch and fishing effort also showed that Philippine small pelagic fish stocks are overfished in the commercial fishery. A countrywide

SECTION [MARKETING]

AUTHOR [Dela Cruz, Z.S. and M.S. Lizarondo]

TITLE [Tuna fishing in Leyte]

SOURCE [Agricultural Marketing Report V (12)., 1983., 60 p]

PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Dela Cruz, Z.S., F.L. Bungcayao, L.N. Gea]

TITLE [Shrimp and Prawn Production and Distribution in Camarines Sur]

SOURCE [Agricultural Marketing report VII (6)., 1985., 96 p.]

PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Dela Cruz, Z.S. and M.S. Lizarondo]

TITLE [Tuna Trading in Leyte]

SOURCE [Agricultural Marketing report Vol. V, No. 13., 1983., 53 p.]

PUBLISHER [BAECON]

ABSTRACT:

Tuna marketing in Leyte is noted to be characterized by several linkages, namely: fishermen - brokers, fishermen - wholesalers, fishermen - retailers, fishermen - wholesaler - retailers, brokers - wholesaler - retailers, brokers - retailers, wholesalers -- wholesaler - retailers and wholesaler - retailers. Traders' buyers are composed of wholesalers, retailers and consumers. Dispositions are regulated by consignment, cash and/or credit terms. Tuna producers have no control over the price of the product although some price assignments were being done. At the fishermen level, the market indicates a combination of an oligopolistic and competitive market situation. In the case of traders, the degree of competition differs by level of trading. At the brokers' market, the fewness of traders implies an interdependent relationship. The wholesalers' market indicates an oligopolistic structure. Like the brokers, its size is small. They procure supply in bulk although they usually handle one or two species. Among retailers, a relatively competitive market structure exists although they handle differentiated product.

The costs components in the disposition of tuna plus all other marine species at the trader level were labor (handling/hauling/packaging), transport and miscellaneous items (such as ice, food, plastic bags, stall ticket fee, etc.). The study noted that low gross margins were obtained by wholesalers and retailers were tuna species were accounted for independently from other species. Similar results were noted when tuna trading was combined with all other species. However, with tulingan, trading gave favorable income effect to retailers.

SECTION [MARKETING]

AUTHOR [Dela Cruz, Z.S., C.M. Arancillo, F.L. Bangcayao]

TITLE [The Tuna Marketing System in the Puerto Princesa, Palawan]

SOURCE [Agricultural Marketing report VII (4)., 1985., 76 p.]

PUBLISHER [BAECON]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Dent, G.H.]

TITLE [An Examination of Alternative Methods of Project Appraisal with Special Reference to the Naga-Calabanga Integrated Fisheries Development Project, Philippines]

SOURCE [Thesis, Master of Economics, The University of New England, New South Wales, Australia., 1984., 176 p.]

ABSTRACT:

The role of project appraisal in facilitating a Government's

non-efficiency objectives such as income distribution (equity), has been a highly controversial topic among academic economists and institutions such as the World Bank.

The so-called "Traditional" Methodologies, like that developed by Gittinger, consider that Project Appraisal should be exclusively concerned with efficiency. An efficient allocation of resources can be achieved by reference to the Kaldor-Hicks Compensation Criteria, such that a potential Pareto improvement is attained.

The development experience of the last two decades has tended to confirm the view that Project Appraisal, based on the Traditional Methodology, has failed to significantly benefit the lowest income group.

The Methodology by Squire and van der Tak is based on the earlier work by Little and Mirrless. It seems to address this apparent failing of Traditional Project Appraisal by explicitly incorporating in the analysis, distribution weights based on the increased consumption which income groups can expect to receive as a result of a project being undertaken.

The Squire and van der Tak Methodology has been criticized in the literature, mainly on the grounds that it involves questionable value judgments which can facilitate unethical manipulation of the data.

The Gittinger and Squire and van der Tak Methodologies will be compared and contrasted by undertaking an actual appraisal of the Naga-Calabanga Integrated Fisheries Development Project, Philippines. By the practical application of these methodologies to an actual project, the positive and negative aspects of each will be highlighted.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Dickson, J.O.]

TITLE [Pangul Bay, Philippines. The cause of its over-exploitation and suggestions for its rehabilitation, p. 218-234]

SOURCE [Papers presented at the Symposium on the Exploitation and Management of Marine Fishery Resources in Southeast Asia held in conjunction with the Twenty-second Session of the Indo-Pacific Fishery Commission, Darwin, Australia, 16-26 February 1987. RAPA/REPORT., 1987/10., 552 p.]

ABSTRACT:

Pangul Bay, one of the richest fishing grounds in Mindanao, has been proven to be depleted of its fishery resources. Studies conducted showed the prevalence of immature fishes and macroplankton and revealed declining catches of various types of gears operating in the bay. Due to the unabated proliferation of various gears, fish stocks have decreased to make evident the depletion of the bay.

The concentration of filter nets or "sunggab" in the bay is attributed to socio-political, topographical and hydrological factors. The bay being bounded by these provinces makes it difficult for authorities concerned to implement an appropriate fisheries regulation for economic reasons.

The operation of the "sanggab" gear and its distribution are discussed and presented in this paper. With the promulgation of a fisheries administrative order, a development plan is proposed to ensure the effective

protection and conservation of fishery resources and to provide alternative livelihood projects for the displaced fishermen of Panguil Bay.

FAO No. 133, supposed to take effect on 5 June 1981, establishing a closed season of 5 years in Panguil Bay for the operation of all kinds of fishing gear, particularly, "sanggab", was not pushed through due to socio-political and multi-province vested interests. Sanggab operators in a dialogue with the Regional Task Force for a moratorium in the demolition of the gear which would result in socio-economic dislocation of the fishermen. The FAO expired on 5 June 1986 and has not been renewed pending the submission of findings and recommendations of 3 Asst. Regional Directors for Fisheries in Reg. IX, X and XII on the effects of the 5-year ban, which will serve as basis for action of the committee on FAOs.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Evans, E.D.]

TITLE [Legal and Policy Consideration for Use of the Chartered Fishing Vessels in Philippine Waters]

SOURCE [1980., 35 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [foreign fishing, fishery regulations, exclusive economic zone]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

A legal consultancy was carried out in the Philippines through the offices of FAO/UNDP in order to review the policy and procedures for chartering foreign vessels for participation in fisheries of the Philippines. The legal status of the EEZ and the territorial sea as it is related to foreign fishing is discussed.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [FAO Government Cooperative Programme]

TITLE [Small-scale Fisheries Development, Bayawan, Negros oriental, Philippines. Project Findings and Recommendations]

SOURCE [1987., 38 pp.]

PUBLISHER [FAO, Rome]

ABSTRACT:

A summary made of activities of the first phase of the Philippines Pilot Small-scale Fisheries Development Project in Bayawan conducted March 1982-June 1986. Cooperative institutional framework, building and basic shore facilities, collective marketing system, socio-economic and marketing study, improved fishing vessel and gear and collecting, holding and marketing of milkfish fry are discussed in detail. Recommendations regarding organizations,

training, infrastructure, facilities, marketing system, improved boats and fishing methods, fish seed bank operation and project extension are included.

SECTION [MARKETING]

AUTHOR [FAO/UNDP South China Sea Fish. Dev. Coord. Programme]

TITLE [Joint ADP/FAO (SCSP-INFOFISH) market studies. Vol. 7: Dried Fish Markets in Asia.]

SOURCE [FAO/UNDP, Manila, Philippines, 1983., 60 p.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery products, dried products, industrial products statistics, trade, fishery economics]

GEOGRAPHIC DESCRIPTORS [Philippines, Hong Kong, Singapore, Indonesia, Malaysia, Thailand, Sri Lanka, Pakistan]

OTHER DESCRIPTORS [Southeast Asia]

ABSTRACT:

Southeast Asia has long been one of the world's leading production and consumption areas for dried fish products. This study explores that industry, country by country, takes up the question as to why this product is so popular in Asia, and looks at some statistical data on production, consumption and foreign trade. Countries covered are the Philippines, Hong Kong, Singapore, Indonesia, Malaysia, Thailand, Sri Lanka and Pakistan.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Flores, E. and G. Silvestre]

TITLE [Community-based Coral Reef Fishery Resource Management in the Philippines: The Balicasag Island Experience]

SOURCE [Indo-Pacific Fishery Commission., 1987., pp. 481-493]

ABSTRACT:

This paper attempts to relate the initial success of marine conservation efforts initiated on Balicasag Island, off Tagbilaran, Bohol, Philippines. This is in order to 1) highlight the potential utility (if not necessity) of extension activities in the success of marine conservation efforts in the Philippine situation; 2) stress the need for sustained, holistic approach incorporating resource-user participation in conservation and management and 3) present a more practical and viable approach (if not alternative other than coercive measures, e.g. regulations and enforcement, given the realities of marginal existence in most Philippine coral reef fishery through a preceeding introductory and non-technical treatment of the following: Philippine fisheries; coral reef biology; coral reef exploitation and contribution to fisheries production, stresses on coral reefs; and implications of coral reef destruction.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situations)]

AUTHOR [Floyd, J.M.]

TITLE [Development of the Philippine Tuna Industry]

SOURCE [1986, 60 p.]

PUBLISHER [Pacific Islands Development Program, East-West Center, Honolulu, Hawaii]

ABSTRACT:

In the second half of the 1970s, the Philippines' tuna fishery emerged as the largest and most valuable fishery in the country. Total production of tuna and tuna-like species increased from less than 25,000 metric tons (mt) in the early 1970s to over 200,000 mt in the 1980s. Approximately one-half of the tuna catch consists of skipjack (*Katsuwonus pelamis*) and yellowfin (*Thunnus albacus*) and one-half of frigate tuna (*Auxis Thazard*) and eastern little tuna (*Enthynnus affinis*). Several other tuna and tuna-like species are occasionally caught in the Philippine waters, but they are not landed in commercial quantity and are not distinguished in Philippine fisheries statistics.

Tuna fishing operations are undertaken by both the small-scale and commercial fishing sectors. Small-scale fishermen operate boats less than 3 gross tons (gt), most of which are wooden double-outrigger canoes known as bancas. Although they have traditionally accounted for the majority of tuna production, the small-scale fishermen's share of the catch has declined steadily since 1977. Landings by commercial operators, however have increased rapidly as a result of the successful introduction of large-scale tuna purse-seining operations in combination with fish-aggregating devices, locally known as payaos. This has been accompanied by dramatic increases in frozen and canned tuna exports that exceeded US\$ 90 million at their highest level in 1980 and 1981.

Since 1981, frozen tuna exports have declined and permits have been granted for importing tuna to meet the demands of the local processing industry. The need to import tuna is the culmination of several problems that have plagued the Philippine tuna industry and contributed to its recent decline. These problems include overfishing, resource depletion, and overcapitalization in the industry. They have resulted in fish supply shortages and increasing competition among operators in the industry. This situation has been exacerbated by increased operating costs and taxes for both producers and processors and by deteriorating economic conditions in the Philippines generally. In addition, Philippine tuna exporters have been confronted by external problems over which they have little control. The major external problems are poor international market conditions for tuna commodities, higher import duties on canned tuna imports to the United States, and increased competition from other tuna-processing nations, particularly from Thailand.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Floyd, J.M.]

TITLE [Development of the Philippine Tuna Industry]

SOURCE [1986., 60 p.]

PUBLISHER [Pacific Islands Development Program, East-West Center, Honolulu,

Hawaii]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Floyd, J.M.]

TITLE [Development of the Philippine Tuna Industry]

SOURCE [1986., 60 p.]

PUBLISHER [Pacific Islands Development Program, East-West Center, Honolulu, Hawaii]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Gentiles, Fe Fidelis]

TITLE [Tariff Protection and Comparative Advantage: Philippine Fisheries]

SOURCE [Thesis submitted to the UP School of Economics for the degree of Master of Arts in Economics., 1986]

ABSTRACT:

The purpose of this paper is to take an analytical look at the various government policies that have affected the growth or decline of the fishing industry, placing a heavy emphasis on trade and pricing policies. It is a sectoral study following the framework of previous studies by Dautista and Power (1979) which quantified and investigated industrial promotion policies in the Philippines and by David and associates (1983) which assessed the impact of government policies in agriculture.

Since the domestic resource criterion (DRC) which measures the "ex-post" value of the social opportunity cost of promoting exports and/or import substitutes and the nominal/effective protection rate (npr/epi) criterion which measures the level of protection gained from the tariff system, this study attempts to relate the sector's efficiency as a foreign exchange earner (saver) with the degree of protection received. Moreover, it also provides an analytical look at the consequences and impact of various price intervening policies such as export taxes, and price control on the industry's growth and development.

Based on the computed estimates, the study raises the following points:

- (1) although it may seem that the fisheries on the aggregate receive a

high nominal protection, a more detailed investigation indicates that some of the segments of the industry are heavily penalized. Shrimps and prawns, for instance, (because of the export tax) and canned fish (because of price control).

(2) the negative effective rate of protection for fish canning has been the result of high import tariff protection and restrictive import regulations on raw inputs;

(3) all sectors exhibit strong comparative advantage as evidenced by the low DRC/SER values. The promotion of the fishing industry should be viewed in the light of the conservation policies, international market conditions and a more balanced perspective, i.e., promotion of each sector should not be made at the expense of another promising and viable sector of the industry.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Gonzales, F.R.]

TITLE [The Regulation on Commerical Trawl and Purse Seine in the Philippines]

SOURCE [ICLARM Newsletter., 1985., vol. 8, no. 2, pp. 9-10]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery regulations, trawling, purse seining]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

An account is given of regulations regarding the commercial trawl and purse seine fisheries in the Philippines.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Haque, F. and G. Octavio]

TITLE [An Economic Analysis of Sustenance and Commercial Fishing in Western Visayas, p. 201-208]

SOURCE [Economics of aquaculture, sea-fishing and coastal resource use in Asia...(eds. A.R. Librero and W.L. Collier).., 1979]

ABSTRACT:

This paper reports on the preliminary findings of the marine fisheries study, a part of a regional planning effort in Western Visayas. Seventy-two commercial operators and 309 sustenance fishermen were personally interviewed by trained enumerators throughout the region. Analysis of variance and regression techniques were used where appropriate for statistical manipulation.

The findings include: 1) on the average, the sustenance fishermen's gross return per year was P10,820 as compared to commercial operators' P544,057; 2) significant differences were observed in the gross returns of the commercial operators in the region; 3) significant differences in gross returns among type of business organization, i.e. partnerships and corporations were earning at least 8 times of single proprietorship and family business operators; 4, a

positive relationship between the type of fishing gear (with the necessary investments and gross earnings; 5) estimates of value added by fishing gear used suggest differences of similar magnitude as in gross returns (value added-gross returns - cash expenses); 6) the highest capital-labor ratio for the commercial fishing sector was indicated by purse seine, followed by trawl, the lowest by bagnet.

A generalized production function was fitted to the data to study the input productivities of fishing trips, boat length, investment, engine size, catch, single proprietorship, purse seine, hired labor, hook and line, fish corral and experience of operators. Results indicate that catch differed significantly by type of business and type of fishing gear, significant coefficients for boat length, capital investment and engine size.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Maque, F. and G. Octavio]

TITLE [An Economic Analysis of Sustenance and Commercial Fishing in Western Visayas, p. 201-208]

SOURCE [Economics of Aquaculture, Sea-fishing and Coastal Resource Use in Asia. (eds. A.R. Librero and W.L. Collier), 1979]

ABSTRACT:

* see previous entry

SECTION [PRODUCTION AND EFFICIENCY...]

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Hizon, V.R.]

TITLE [The Philippine Tuna Experience]

SOURCE [Proceedings of the INFOFISH Tuna Trade Conference, Bangkok, Thailand, 25-27 Feb. 1986., 1987., pp. 146-151]

PUBLISHER [INFOFISH, Kuala Lumpur]

ABSTRACT:

Details are given of the development of the Philippine tuna fishery industry, describing the purse seining fleet operations, refrigeration procedures and canning activities. Problems facing the industry resulting from the current political crisis in the country are examined briefly.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Hizon, V.R.]

TITLE [The Philippine Tuna Experience]

SOURCE [Proceedings of the INFOFISH Tuna Trade Conference, Bangkok, Thailand, 25-27 Feb. 1988., pp. 146-151]

PUBLISHER [INFOFISH, Kuala Lumpur]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Hizon, V.R.]

TITLE [The Philippine Tuna Experience]

SOURCE [Proceedings of the INFOFISH Tuna Trade Conference, Bangkok, Thailand, 25-27 Feb. 1988., pp. 146-151]

PUBLISHER [INFOFISH, Kuala Lumpur]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Hock, J.C.]

TITLE [Monitoring Environmental Resources through NOAA's Polar Orbiting Satellites]

SOURCE [ITC J., 1984., no. 4, pp. 263-268]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [resource surveys, environmental monitoring, satellite sensing, tuna fisheries, marine resources]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, USA]

OTHER DESCRIPTORS [NOAA]

ABSTRACT:

NOAA's Assessment and Information Service Center (AISC) integrates data from NOAA's polar orbiting and geo-stationary, geographic information, agronomic models and economic models to monitor land and marine resources. Experimental marine monitoring is being carried out in the United States and a special program is being developed to aid the tuna fishing industry in the Philippines.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates)]

AUTHOR [Hodgson, G. and J.A. Dixon]

TITLE [Logging versus Fisheries and Tourism in Palawan: An Environmental and Economic Analysis]

SOURCE [East-West Environment and Policy Institute, Occasional Paper No. 7., 1988., 95 p.]

PUBLISHER [East-West Center, Hawaii, USA]

ABSTRACT:

The pollution of rivers, lakes, and sea by sedimentation is a growing problem throughout the world. Sedimentation pollution of coastal marine areas is especially serious in Southeast Asia where fish harvested from coastal waters serve both as a major source of protein for human consumption and a significant source of foreign exchange through exports. One major cause of sedimentation is logging.

In 1985, a logging operation was begun in the watershed bordering Bacuit Bay (El Nido); Palawan, Philippines. Bacuit Bay is also an important resource for two other foreign exchange earning industries - tourism and marine fisheries. The effects of logging-induced sedimentation on the bay's previously marine environment were the subject of a 1-year ecological study. By the end of the study, only 11 per cent of the available commercial forest had been logged, but high rates of accelerated erosion due to logging had already resulted in dramatic increases of sediment transport and discharge into the bay. Sedimentation damage to bay coral reefs and associated fisheries was rapid and severe.

In order to examine the economic effects of sedimentation pollution on tourism and marine fisheries, predictions of future revenue production based on two development alternatives are presented. The development options are 1) to ban logging in the bay's watersheds or 2) to allow logging to continue as planned. The first option would prevent further damage to the bay's ecosystem due to logging-induced sedimentation and thus the tourism and marine fisheries dependent on it. The second option would maximize logging revenue but reduce revenue from the other industries.

The results of the economic analysis are striking and project a reduction in gross revenue of more than \$40 million over a 10 year period with continued logging of the Bacuit Bay watershed as compared with gross revenue given implementation of a logging ban. The difference is due to projected losses from tourism and fisheries. Present value analysis was performed using both a 10 and 15 per cent discount rate. Even with the higher discount rate, the present value of lost revenue exceeds \$11 million under option 2- continued logging. Sensitivity analysis shows that significant deviation from predicted effects of sedimentation damage do not alter the conclusion. In addition to these quantitative results, consideration of qualitative factors reveals that the social, economic, and environmental benefits of fisheries and tourism outweigh those of logging in this location.

The study demonstrates that the combined use of ecological and economic analyses can provide useful information for government planners seeking to maximize net economic benefits while minimizing social and environmental costs. Recommendations are made regarding application of these results to similar resource conflicts in other regions.

SECTION [MARKETING]

AUTHOR [Javier, E.V., M.S. Lizarondo and T.C. Valdellon]

TITLE [Tuna Production and Marketing System in Quezon Province]

SOURCE [Agricultural Marketing Report Vol. VII, No. 22., 1985., 52 p.]

PUBLISHER [BAECON]

ABSTRACT:

The production and marketing system of tuna in Quezon Province was studied and analyzed in this study. The study showed that tuna and tuna-like species contributed 15% to the total catch of the province. This goes through a series of marketing chains, i.e. producers (commercial fishermen) --- assembler --- wholesaler --- wholesaler - retailer --- retailer --- consumer ; producers (sustenance fishermen) --- broker --- wholesaler-retailer --- retailer --- consumer. The price of tuna is directly proportional to the number of chains in the marketing system.

The cost per fishing trip varied by type of fishing gear used. Average cost is biggest for bagnet (P 7.335) and lowest for hook and line (P 149). Marketing cost per kg is biggest for hook and line (0.62). Fishermen who used purse seine gained the biggest net return per fishing trip.

Among the traders, wholesalers-retailers incurred the biggest cost per kg while retailers enjoyed the biggest net margin.

Fish trading in the landing areas was undertaken through bidding. Nevertheless, most fishermen had one regular buyer. Contract arrangements were uncommon and cash transactions were prevalent.

Big purse-seiners and dynamite fishing posed a major problem to fishermen.

Fishermen have no plans to venture in the export market because of unstable supply of tuna and lack of knowledge about export transactions.

The study then recommends that government disseminate information about tuna like its breeding seasons, market prices and possible market outlets. On-site trainings can solve the fishermen's lack of knowledge in export and other trading practices. Although transportation is not considered a major hindrance, smooth roads can decrease the transportation costs incurred by the producers. Moreover, refrigerated carriers can prevent the spoilage of the products. Government should also consider the presence of commercial fishing boats 7 km from the shoreline which competes with small fishermen. They should look into the plight of the small fishermen in the presence of commercial fishers, and regulate if not ban the commercial boats from the said area.

SECTION [MARKETING]

AUTHOR [Juinio, A.R., Meniz, L.A., Villanoy, C.]

TITLE [Use of Giant Clam Resources in the Philippines]

SOURCE [NAGA, Vol. 10, no. 1., 1987., pp. 7-8]

ABSTRACT:

The commercial exploitation of giant clam Tridachnidae in the Philippines is examined. Generally, the giant clam shell is of greater commercial value than the meat and muscle. Prices and export figures are discussed briefly.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Kent, G.]

TITLE [National Fishery Policies and the Alleviation of Malnutrition in the Philippines and Thailand]

SOURCE [FAO Fisheries Circular., no. 777, 1984., 31 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [marine fisheries, fisheries policy, fish consumption]

GEOGRAPHIC DESCRIPTORS [sociological aspects; ISEW, Philippines; ISEW, Thailand; nutrition]

ABSTRACT:

An examination is made of national fisheries policies and the ways they may be reoriented so that fisheries could make a greater contribution to the alleviation of malnutrition. Two Southeast Asian nations with well developed fisheries (the Philippines and Thailand) are considered, reviewing their fisheries policy and nutrition policy and examining interrelationships between them in order to identify ways in which fishery products might be made more readily available to the malnourished segments of their populations.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Laopao, M.L. and E.M. Latorre]

TITLE [Small-scale Fishing in Leyte Province: A Socio-economic Survey.]

SOURCE [Economics Research Report No. 8., 1979 series., 87 p.]

PUBLISHER [Bureau of Agricultural Economics, Quezon City, Philippines]

ABSTRACT:

The study aimed to determine the state of fishing technology; to estimate the level of fish production of small-scale fishermen in the study area; determine the size of capital investment, the costs and return profile and the profitability of small-scale fishing in the province; and to determine the levels of income of the small-scale fishermen households, the extent of income inequality and the factors affecting the variation in this income.

The survey covered a total of 221 fishing households drawn from 55 selected fishing barangays, representing a cross-section of the rural fishing population in the province. The reference period is exactly one year, covering July 1977 to June 1978.

Very low levels of income characterized most fishing households. About 54 per cent of the sample households live at bare subsistence levels. The low productivity per fishing effort and the lack of opportunities during off-season explained some of the causes of poverty. As a result of the increase in the price of fuel and the shortage in fuel supply, a large number of fishermen operating motorized boats were shifting to non-motorized fishing craft. The authors recommend the establishment of pilot fishing cooperatives in strategic fishing barangays and the initiation of a small-scale industry program to exploit indigenous marine products and provide employment to fishermen during off-season and typhoon months.

SECTION [MARKETING]

AUTHOR [Librero, A.R.]

TITLE [Marketing System for Fish in the Philippines, p. 197-203]

SOURCE [Small-scale fisheries in Asia: Socio-economic Analysis and Policy (ed. Panayotou, T.), 1985., 283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

The paper attempts to do a critical analysis of the fish marketing system in the country through a review of pertinent studies and surveys on the subject. Limitations of this paper are imposed by the very nature of the literature available, which tend to be area-specific (limited to a particular landing area and market or province and sectorally stratified as either inland (aquaculture), municipal, or commercial fisheries alone.) The paper is based on secondary data and earlier work by the author and others on the marketing system of the Philippines. After analyzing market structure in terms of the degree of concentration of sellers and buyers, product differentiation, and conditions of entry and exit, the author concludes that the fish marketing systems in the Philippines is imperfectly competitive and approaching oligopoly in many cases: the number of sellers is small relative to that of buyers; the product is differentiated according to species, size, and freshness; and entry to fish trading is not always easy because of capital and skill requirements. The most common marketing practices are auction sale, contract sale, and sale on a first-come-first-served basis. Fish auctions in the Philippines are of particular interest because of the so-called "whispering system" used in receiving bids. This allows the seller to take into account nonprice considerations, such as the credit standing, honesty, and loyalty of the buyer, so that the sale does not always go to the highest bidder. In general, fish-prices varied directly with size and freshness and inversely with the credit standing of the buyer, the size of the lot bought, and the volume of fish available in the market. Librero concludes that, to increase the efficiency of the marketing system in the Philippines, it would be necessary to develop more landing facilities, improve the distribution of ice plants, and reduce the number of links in the market chain.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Librero, A.R. and R. Catalla]

TITLE [Impact of Credit on Small-scale Fisheries in the Philippines, p. 223-234]

SOURCE [Small-scale fisheries in Asia: socioeconomic analysis and policy., 1985., 283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

The study is intended to determine the extent to which financing programs have been effective in bringing about technological and socio-economic changes among the small-scale fishermen and is based on a nationwide socio-economic survey in 1979. Based on a sample of 500 fishermen borrowers and non-borrowers, the authors evaluate the credit program for Philippine municipal fishermen. This program, which was put into effect in 1974 by the Development

Bank of the Philippines, permits loans for municipal fishermen up to 5000 PHP/borrower without collateral requirements (7.38 pesos [PHP] = US \$1). The performance of the credit scheme is evaluated in terms of repayment and of impact on technology, catch, income, and general welfare of the recipients. By 1979, only 1% had fully repaid their loans, 64% had made partial payments, and 35% had made no payment at all. In terms of impact, the credit program contributed significantly to enlargement and motorization of vessels, to modernization of gear, and to expansion of fleet but very little, if at all, to production, incomes and general welfare because of the limited fishery resources, their open-access status, and circumstances unforeseen at the initiation of the program, such as the rise in fuel prices. In the light of these findings, it is imperative to reexamine and restructure credit and similar programs to account for factors that have been found to impinge upon their performance both in terms of repayment and impact.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Librero, A.R., Collier, W.L. (eds.)]

TITLE [Productivity and Profitability of Trawlers and Purse Seiners in Southeast Asia]

SOURCE [Economics of aquaculture, sea-fishing and coastal resource use in Asia. Proceedings of the second biennial meeting of the agricultural economics society of Southeast Asia, November 3-6, 1977, Tigbauan, Iloilo, Philippines., 1979., pp. 253-260]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [marine fisheries, fishery economics, fishing vessels]

GEOGRAPHIC DESCRIPTORS [Singapore, Malaysia, Philippines, Thailand]

ABSTRACT:

The productivity and profitability of the different sizes of fishing vessels in selected fishing ports of Singapore, Malaysia, Philippines and Thailand are discussed. Information regarding costs and earnings of the fishing units and production by vessel size is presented.

SECTION [MARKETING]

AUTHOR [Librero A.R., Collier, W.L. (eds.)]

TITLE [Inter-regional Trade and Price Relationships for Philippine Milkfish Fry]

SOURCE [Economics of Aquaculture, Sea fishing and Coastal Resource Use in Asia. Proceedings of the Second Biennial Meeting of the Agricultural Economics Society of Southeast Asia, November 3-6, 1977, Tigbauan, Iloilo, Philippines., 1979., pp. 43-60]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [trade, pricing, fry, fish culture]

BIOLOGICAL DESCRIPTORS [Chanos-chanos]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

A survey was undertaken, March-August 1977, to follow milkfish (*Chanos chanos*) fry from fry grounds through the marketing chain of concessionnaires, dealers, agents, brokers and nursery pond operators to rearing pond and fishpen operators. Initial findings from the survey and other data obtained from regional and district offices of the Bureau of Fisheries and Aquatic Resources regarding interregional trade flows and the relationship between average monthly fry prices in the major market areas of the Philippines are presented. Results show the existence of a milkfish fry system in the Philippines that is national in scale, with a predominant role played by concessionnaires and dealers in Mindanao and by nursery pond operators in Bulacan and Rizal.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Librero, A.R., D. Ramos, and L. Lapie,]

TITLE [Fish Capture Technology: its Relationship to Productivity, Income and Employment in the Philippines]

SOURCE [Fisheries Resources Journal, Philippines., 1982., vol. 7, no. 2, pp. 1-20]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishing gear, catching methods, fishing vessels, fishery economics]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

A survey of 506 municipal fishermen was conducted in 8 regions in the Philippines to examine the productivity and costs and returns for various types of boat, motorization and types of fishing gear. Seventy-six percent of boats used by sample municipal fishermen were motorized mostly powered by more than 14 Hp engines. Boats were generally small ranging from 0.12 to 3.00 GT. Most fishermen used boats of less than 1.00 GT. The two common gear used were lines and nets. The former consisted of handlines and longlines while the latter included gill net.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Librero, A.R., D. Ramos, and L. Lapie]

TITLE [Mechanization: Its Impact on Productivity, Cost Structure, and Profitability of the Philippine Municipal Fishery, p. 151-162]

SOURCE [Small-scale fisheries in Asia: socioeconomic analysis and policy., 1985.,

283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

This study attempts to investigate the economics of small-scale fisheries, costs and returns, income, and employment aspects as they relate to fishing technology in the Philippines.

The authors compare mechanized and nonmechanized fishing units in the Philippines in terms of catch, costs structure, and profitability. They found that most types of gear were more productive when used in motorized boats; for certain types such as beach seines, however, motorization was not an apparent advantage. The total cost of a motorized boat was on the average four times that of a nonmotorized boat. Fuel was the largest single cost item for motorized boats, accounting for 37% of total cost. Labour costs accounted for 38% of the total costs of nonmotorized boats but only for 22% of the costs of motorized boats; of the former percentage, half was the imputed cost for family labour compared to less than one-third for the latter. In the Visayas, nonmotorized fishing units earned net income several times higher than the motorized boats. A similar situation was found in Luzon except that the difference was smaller. In contrast, in Mindanao, the reverse occurred with motorized boats earning 30% more than the nonmotorized boats. Moreover, nonmotorized boats earned, on the average, positive resource rents, whereas motorized boats had considerable losses. The reasons are clear: the fishing costs of motorized boats were four times higher than those of nonmotorized boats but their catch was only twice as large. Moreover, the unit value of the catch of motorized boats was 22% lower than that of nonmotorized boats. The combined outcome of these factors was a negative return to capital for motorized boats compared with a 72% return for nonmotorized boats, a finding that has important implications for the policies that promote industrialization.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Librero, A.R., R.F. Catalla, and R.M. Fabro]

TITLE [Socioeconomic conditions of small-scale fishermen and fish farmers in the Philippines p. 36-45]

SOURCE [Small-scale fisheries in Asia: socioeconomic analysis and policy (ed. Panayotou, T.), 1985., 283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

The purpose of the study was to provide the necessary information for the formulation of government assistance programs through surveys and description of the absolute and relative socioeconomic conditions of municipal fishermen and of fish farmers, whose numbers have been increasing rapidly in recent years.

The paper compares income levels and other indicators of well-being of municipal fishermen and fish-farmers in the Philippines with those of rice and coconut farmers and concludes that municipal fishermen with an annual net household income of US\$675 (58% from fishing were, on the average, better off than rice farmers with US\$476 but not as well off as coconut farmers with US\$804 and far below the rural and national averages of US\$932 and US\$1,149

respectively. In some contrast, fish farmers' incomes US\$3,378 were found to be almost three times the national average. Moreover, important regional differences were identified in Luzon and Mindanao, fishermen's annual incomes approached the rural average, but in the Visayas they lagged far behind, US\$223 suggesting the latter as a priority area for government assistance. In terms of the ratio of food expenditure to total consumption expenditures and other indicators, such as ownership of residential lot, water supply, and toilet facilities, fishing households compared unfavorably to both rice and fish-farming households.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Librero, A.R., I. Pabuayon, and A. Aquino]

TITLE [Production and Marketing Systems in Rainfed Agriculture, Fisheries, and Forestry in Bicol: A Regional Profile. (PP. 186-244)]

SOURCE [Report of a project funded by the Rainfed Resources Development Project (RRDP). Socio-economics Research Department, PCARRD, Los Banos, Laguna, 1986., 271 P.]

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Librero, A.R., I.M. Pabuayon, and A.G. Tidon]

TITLE [Production and Marketing Systems in Rainfed Agriculture, Fisheries and Forestry in Western Visayas: A Regional Profile]

SOURCE [1987., 228 p.]

PUBLISHER [Socio-economics research Department, Philippine Council for Agriculture and Resources Research and Development, Los Banos, Laguna, Philippines]

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Librero, A.R., I.M. Pabuayon, A.G. Tidon, N.D. Salayo, and B.Y. Reyes]

TITLE [Production and Marketing Systems in Rainfed Agriculture, Fisheries and Forestry in Eastern Visayas: A Regional Profile]

SOURCE [1986., 173 p.]

PUBLISHER [Socio-economics Research Department, PCARRD, Los Banos, Laguna, Philippines]

SECTION [SOCIOECONOMIC CONDITIONS (Industry situationers)]

AUTHOR [Librero, A.R., I.M. Pabuayon, B.Y. Reyes, T.P. Calabia and C.S. Suguitan]

TITLE [Production and Marketing Systems in Rainfed Agriculture, Fisheries and Forestry in Cagayan Valley: A Regional Profile]

SOURCE [1987., 138 p.]

PUBLISHER [Socio-economics Research Department, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Banos, Laguna, Philippines]

SECTION [SOCIO-ECONOMIC ASPECTS]

AUTHOR [Lim, Cristina]

TITLE [Population Pressure, Migration and Fishing Effort in Coastal Areas of Camarines Sur]

SOURCE [MS Thesis, UP Los Banos, 1989]

ABSTRACT:

This study was conducted to determine and relate demographic pressure with fishery exploitation in coastal areas characterized by open access in Camarines Sur. It also tried to investigate factors which likely affect migration, a primary factor in population pressure. Furthermore, it sought a relevant relationship between the probability of the fishermen to migrate or not given some indigenous and exogenous variables.

Since coastal areas of Camarines Sur was not clearly defined and identified, the study attempted to make its own definition and was able to come up with 13 coastal municipalities. Using description analysis, evaluation of demographic pressure was made possible. Results revealed that increasing population primarily brought about by in-migration exerted pressure on the limited resources of coastal areas. This is compounded by the open-access nature of the fishery resource which resulted in uncontrolled entry of outside fishermen. Consequently, this increase led to intensive utilization of existing agricultural and fishery resources and technical change in fishery (change in fishing method, intensification and expansion). The latter suggests over-exploitation of the resources as indicated by the disappearance of some fish species, low catch, conflicts among users of the resource, low income and order.

The logit model was used to determine the factors affecting perception of utility hence, probability of migration. Variables which significantly affected migration decision were household size, ownership of fishing gear, presence of other sources of income, education, skill of fishermen, and civil status. These were proxy variables related to individual's personality characteristics, perception of situation and perceived characteristics of origin and destination areas. Of the variables, the probability of the fishermen's to migrate most sensitively responded to ownership of fishing gear, a form of security.

Results implied enforcement of policies which would alleviate socio-economic condition of small-scale fishermen, reduce pressure on the fishery resource, and inhibits out-migration of local people. These include:

banning the catching of fast disappearing and juvenile fish species, illegal fishing and formal sanction in case of violation; provision of alternative or supplementary sources of income as a response to the need of providing local employment and promoting equitable distribution of benefits; organization of fishermen into cooperative or association to oversee conceived livelihood; assignment of fishing right to a group of fishermen to counter open access nature of the resource and acts as an incentive to manage the resource; redirection of present educational system to suit the local needs; and intensive campaign for small household size.

Recommendation were also made for the procurement of aerial photographs or its substitute to estimate coastal population (a target beneficiaries) ; for further examination of the kinship, distance, population density at origin area roles in migration decision; and lastly, for the concerned government authority to closely and constantly monitor the gathering of data or they be reliable updated and properly filed for public use.

SECTION [MARKETING]

AUTHOR [Lisac, M.]

TITLE [Some Aspects of Fish Utilization in Small-Scale Fisheries]

SOURCE [1980., 25 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery products, fish handling, marketing,
fishery economics]

GEOGRAPHIC DESCRIPTORS [Philippines, Thailand]

OTHER DESCRIPTORS [processing fishery products]

ABSTRACT:

The consultant visited fishing villages and cooperatives in the Philippines and Thailand with the task of identifying the problems of fish handling, distribution, processing and marketing. A short summary of his findings in each fishing village is presented.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Lizarondo, M.S. and A.D. Lucido]

TITLE [Cost structure and Profitability of Sustenance Fishing in Capiz]

SOURCE [Agricultural Marketing Report, Vol. V, No. 9., 1983., 42 p.]

PUBLISHER [BAECON]

ABSTRACT:

Marine commercial and municipal fishing comprise the biggest group in the fishing industry. Sustenance fishing alone contributed around 45% to total fish production. Despite this contribution, development of this group has been rather slow; and sustenance fishermen remain the lowest income group in the whole fishing population.

The main objective of the study is to estimate the costs and returns

of producing and processing fish by sustenance fishermen. Primary data was obtained in Capiz, where all municipalities known to be sustenance fishing areas were covered. Sample barangays were drawn, with a minimum of 2 per municipality. Purposive sampling was applied in selecting respondents, with a minimum of 30 fishermen interviewed from each municipality.

Conclusions of the study were as follows:

- bulk of total fish catch comes from small operators
- fimbriated sardines are the biggest contributor to fish production
- drag seine contributed highest yield
- fishing by drag seine require biggest amount of capital
- drag seine and baby trawl scored the highest capital outlays
- cost of fish production was biggest among small sustenance fishermen (P 2.50) - A net profit of P 0.85/kg was obtained by small sustenance fishermen - for every peso invested in sustenance fishing, an average operator gained 0.11 to 0.25.

The study ends with the following recommendations:

- credit policies must be reviewed because of increasing capital outlays - there is a need for cost assistance
- processed fish in Capiz must be explored
- Additional cost and return studies

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S., E.P. Piansay and F.L. Bungcayao]
 TITLE [Small-scale Fishing in Capiz: production, processing and marketing]
 SOURCE [Agricultural Marketing Report V (5)., 1983., 52 p.]
 PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S. and C.N. Arancillo]
 TITLE [Developing the Prawn and Shrimp Industry in the Philippines: Production and Marketing Relationships]
 SOURCE [Agricultural Marketing Report VII (16)., 1985., 90 p.]
 PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S., T.C. Valdellon, and M.Y. Maron]
 TITLE [Sustenance Fisheries in Ilocos Sur: Management and Exchange process]
 SOURCE [Agricultural Marketing Report VI (2), 1984., 161 p.]
 PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S., E.V. Javier, A.D. Lucido]
 TITLE [The prospects for production and marketing of the shrimp and prawn industry in Camarines Norte]
 SOURCE [Agricultural Marketing Report VII (6), 1985., 96 p.]
 PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S. and C.N. Arancillo]
 TITLE [Tuna Production and Marketing in Zamboanga del Sur]
 SOURCE [Agricultural Marketing Report Vol. VI, No. 3., 1984., 75 p.]
 PUBLISHER [BAECON]

ABSTRACT:

The study covered 108 tuna fishermen and 35 tuna traders. Three types of fishing gear were reported: hook and line (rambulan), ring net (pukot, panalikop) and purse seine (kubkub pangulong).

The months of April, June and July proved to be the busiest in Tuna production. Hook and line operators contributed 72 percent to total production while ring netters shared 27 percent and the residual was attributed to the purse seiners. Analysis of the costs and returns showed a positive gain both for the traders and the fishermen.

Some of the fishermen were engaged in other types of endeavor to augment their income. About 55 percent of the total income were from fishing and 45 percent were generated from other occupations.

Fishermen indicated no major problem in product disposition. Tuna fishermen made more use of the wholesaler-retailers although there were other outlets identified, namely: brokers, wholesaler, retailer, processor, institutional buyer and consumer. Transactions are often on a cash basis. At present, tuna industry in Zamboanga del Sur is concentrated among the few. One major factor considered was the high degree of concentration of the business in top three tuna fishermen and top two traders.

The study in Zamboanga del Sur failed to consider the export aspects of the industry. Thus, an in-depth investigation or an expansion of statistical data covering the export potential of tuna is recommended. Moreover, information dissemination is highly needed to improve the bargaining strength of fishermen. The low returns received by fishermen as compared to traders is due to the high

operating costs they incur. It is suggested, therefore, that a study of the cost and price structure of the industry be undertaken. The government should also expand or develop new tuna products in processed form. It has been observed that small tuna (tulingan) are abundant and are still under-utilized. Concomitantly, there should be an extensive market research in order to determine and strengthen market demand for tuna species.

SECTION [MARKETING]

AUTHOR [Lizarondo, M., T. Valdeillon and Z. dela Cruz]
 TITLE [Marketing Operations of Sustenance Fishermen in Pangasinan]
 SOURCE [Marketing Research Report 1 (3)., 1979., 77 p.]
 PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S. and A.D. Lucido]
 TITLE [Tuna Production and Marketing System in Surigao del Norte]
 SOURCE [Agricultural Marketing Report Vol. VII, No. 1., 1985., 31 p.]
 PUBLISHER [BAECON]

ABSTRACT:

Because tuna is a highly-valued export product in the country, the analysis of the major factors related to its production and marketing is vital. This study then is in answer to this need. It describes and analyzes the marketing system for tuna in Surigao del Norte.

The following are the findings of the study:

- 1) Tuna fishermen directed their catch mostly to either wholesalers or retailers. Transactions with brokers, exporters and other types of buyers were limited.
- 2) Common fishing grounds are the Mindanao Sea, Pacific Ocean and Surigao Strait. Transportation was not considered a problem because buyers are in the shore. These buyers most often than not are also the financiers of the operational needs of the fishermen. They (buyers/financers and fishermen) form a marketing agreement and transacts business in cash basis.
- 3) Analysis of costs and income showed a relatively good profit position for fishermen. The principal cost were labor and provisions (fuel and food for the crew.)
- 4) Major marketing cost items were ice, labor and market fees.
- 5) The industry can also be a profitable export industry.

The following are the recommendations of the study:

- 1) The choice of market outlets and bargaining strength of the fishermen are limited due to financier/buyer-fishermen tie-up. Fishermen should gradually break away from this tie-up and look from other sources of funds in order to experience greater profits.

2) The market for tuna is very promising and fishermen should find ways to increase catch in order to increase their income.

3) Government should exploit the possibility of the industry to be a dollar earner. Foreign markets can be explored through embassies.

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S., M.Y. Maron, E.V. Javier]

TITLE [The Production and Distribution Structure of the Shrimp and Prawn Industry in Iloilo]

SOURCE [Agricultural Marketing Report VI (13), 1984., 87 p.]

PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Lizarondo, M.S. and T.C. Valdellon]

TITLE [Production and Marketing Operations of Tuna Fishermen and Traders in the Philippines]

SOURCE [Agricultural Marketing Report Vol. VII, No. 27., 1985., 89 p.]

PUBLISHER [BAECON]

ABSTRACT:

This report consolidates seven researches conducted in Palawan, Surigao del Norte, Eastern Samar, Basilan, Quezon, Batangas and South Cotabato. The study describes and analyzes the tuna marketing system in the Philippines. Analysis show that tuna distribution involved 15 types of marketing flow and fish assemblers and wholesalers procured the bulk of catch. The study notes that fishermen sold directly but on smaller quantities to exporters and processors. Dispositions were mostly cash and carry at the fisherman level and consignment at the trader level. There was access to price information. Supply and demand conditions guided price setters.

During the reference period, the fishermen recorded net margin at P 3.01 per kilogram of tuna. Traders grosses P 0.91 to P 2.95 per kilogram. Retailers and assemblers reported the widest net margins at P 2.50 and P 2.20 per kilogram, respectively. The market characteristics approached a purely competitive set-up. Exporters confirmed that demand for Philippine Tuna has been increasing. The major problems of fishermen were unfavorable weather condition, competition with big fishers, piracy, high costs of fishing operations and lack of capital. Traders complained of inadequate transport and storage facilities while exporters faced growing competition with other exporters and lack of regular supply. Suggestions included effective information dissemination and access to marketing facilities.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Lopez-Dee, E.P.]

TITLE [Welfare Implications in the Appraisal of Projects: A Case Study of the Fishpond Estate Project in the Philippines]

SOURCE [Thesis, Master of Agricultural Development Economics, Australian National University., 1983., 174 p.]

ABSTRACT:

This study makes use of two contrasting approaches in the ex ante analysis of a specific project in the Philippines, the "unified" Little and Mirrless and Squire and van der Tak (LM/ST) and Harberger approaches. In the light of the latter approach, it explores the practicability and relevance of introducing social analysis in investment decisions.

The rationale and convention for the application of the two methodologies are reviewed and detailed in a manner so that their differences are clearly reflected. They are then applied to the smallholder Fishpond Estate Project to ascertain whether or not the addition of equity criteria can assist in improving the quality of decisions in public expenditures by confronting the allocative efficiency effects.

SECTION [MARKETING]

AUTHOR [Mabunay, M.L.E.]

TITLE [Socio-economics of Marketing Practices of Small-scale Capture Fisheries in Iloilo Province, pp. 165-177]

SOURCE [Resources, Management and Socio-economics of Philippine Marine Fisheries (eds. D. Pauly, J. Saeger and G. Silvestre) Department of Marine Fisheries Technical Report 10., 1986., 217 p.]

ABSTRACT:

This study describes the management of fish catch and its disposal by small-scale fishermen. It shows the network of linkages along which the products move, and examines the socio-economic characteristics of those engaged in fish marketing in the rural setting of six coastal communities (barangays) in Concepcion, Nueva Valencia, and San Joaquin, in the province of Iloilo.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Mascialino, C.]

TITLE [Industrial Outlook Report: The Philippine Fishing Industry, September 1984]

SOURCE [1984., 13 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery industry, catch statistics, trade, fisheries, fishery economics]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

Philippine fishermen caught more than 1.9 million metric tons of fish and shellfish in 1983, a 2% increase over 1982 catch. Total fishery exports increased by 23% in quantity and 44% in value, primarily because of increased shipments of tuna and shrimp. Tuna exports benefitted from improved competitiveness caused by the peso's devaluation, increased demand in the United States, Italy, the Federal Republic of Germany, the United Kingdom, and Canada.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [May, R.C., Smith, I.R., Thomson, D.B.]

TITLE [Comparative Efficiency of Gasoline, Kerosene and Diesel Engines for Philippine Bancas]

SOURCE [Appropriate Technology for alternative energy sources in fisheries. Proceedings of the ADB/ICLARM Workshop on Appropriate Technology for alternative energy sources in fisheries, Manila, Philippines, 21-26 February 1981., ICLARM Conference proceedings, no. 8, 1982., pp. 65-69]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishing vessels, fuels, cost analysis]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

This paper compares the technical efficiency of gasoline, kerosene and diesel engines for Philippine bancas, using 7 and 10 hp samples of popular brands. On the basis of technical information supplied by manufacturers, diesel engines have an advantage in terms of power, speed and fuel consumption over both kerosene and gasoline engines. The cost analysis reveals that at the rated output of 7 hp, kerosene engines are the most cost efficient, while at 10 hp, diesel engines are the most cost efficient.

SECTION [SOCIO-ECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [MNR-BFAR-FIDC-NEDA-NC90]

TITLE [Inventory of fishery unit's household survey]

SOURCE [1979 (December).. 76 p.]

PUBLISHER [FIDC]

ABSTRACT:

Contains data basically on the activities of the municipal fishing

SECTION [MARKETING]

AUTHOR [Navera, E.R.]

TITLE [Fish Marketing at the Navotas Fish Landing and Market Authority, Navotas, Rizal, 1973-74]

SOURCE [M.S. Agricultural Economics, UPLB, Los Banos, Laguna., 1976., 198 p.]

ABSTRACT:

The study examines and analyzes the distribution channel, market structure, marketing costs and margins, and pricing of fish at the Navotas Fishlanding and Market Authority (NAFILMA) in Navotas, Rizal, during the period July 1973 to June 1974.

The market structure of NAFILMA approaches that of an oligopoly where the major determining factor was the limited number of sellers (fish brokers) and concentration of market share in the hands of few.

For every tub of fish sold, the average marketing cost is estimated at P 5.10 for the producer and P 2.69 for the broker. The broker's gross marketing margin is P 4.86 per tub which gives him a profit (before income tax) of P 2.17 per tub.

Gross marketing margins are fixed percentages of the retail prices implying that as retail prices increase, marketing margins also increase. In terms of shares in the consumer's peso, the producers accounted for 57%, and marketing group 43%.

Pricing analysis shows that in general, estimates of the relationships of the price of fish by species with the quantity demanded of it and the quantity of all other species are significant for the more predominant species.

The direct and cross price flexibilities are less than one for practically all the species, implying that the percentage changes in prices are less than the corresponding percentage changes in quantities. It also implies that total revenue from each species may be expected to increase with decrease in price. However, the price elasticity of demand for fish in the aggregate, i.e. for all species together, is much less than the individual elasticities of any of the species. The cross price flexibilities are mostly negative, implying substitutions among the different species.

Both pricing and operational inefficiencies obtain in the market are identified to be caused mainly by the oligopolistic structure of the market, and the lack of knowledge about the market, which are due to the poor and inadequate market facilities and the method of selling in secret auction or whisper bidding.

Policy implications dictate that any attempt to improve the efficiency of the market must be approached as a system and directed towards improving the conditions that make possible such marketing practices.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Octavio, G.G., M.E.S. Piadozo and I.S. Pamplona]

TITLE [An Assessment of the Credit and Financial Programs for the Fishery Sector, Philippines]

SOURCE [AFSSRN Research Report No. 9., UPLB/COEM and CPUS., 1986., 105 p.]

ABSTRACT:

The study assessed the nature, extent and procedure involved in the

fishery credit programs. It also determined the magnitude of loans extended to small-scale fishermen and fishpond operators through the Biyayang Dagat (BD) and Kilusang Kabuhayan and Kaunlaran (KKK) fishery credit programs. The cost of lending and borrowing as well as the effects of lending policies on loan recipients such as interest rates, mode of loan disbursement, loan size and manner of borrowing were also determined.

Both primary and secondary data were gathered. Secondary data were collected from the published materials of various government and private institutions, while the primary data were gathered from the small-scale fishermen and fishpond operator-recipients of the BD and KKK credit programs using pre-tested questionnaires. In addition, participating banks in the study areas (Pampanga, Capi2 and Aklan) were also surveyed with regards to their involvement in the two fishery credit programs.

Descriptive analysis, cost and returns analysis, lending cost analysis, t-test, correlation analysis and Duncan's Multiple Range Test (DMRT) were the methods used in analyzing the data.

The findings of the study showed that the bulk of fishery credit program borrowers were in Region VI. At the national level, a total of about 100 and 400 million pesos were extended to BD and KKK borrowers, respectively, as of March 1986. Repayment rate on BD loans was 26% while on KKK loans, only 3%.

The implementation of the BD and KKK programs enabled fishermen to purchase modern fishing equipment through loan acquisition, but this did not significantly increase their income. Some fishermen attributed their added income to earnings from other occupations. However, an increase in the volume of catch of the respondents after loan acquisition was observed. Statistical analysis showed that borrower's income and welfare were favored by low rate of interest, staggered mode of loan disbursement, individualized borrowing and a loan size ranging from P 11,401 - P 14,999 per borrower.

Finally, the study found out that the previous and existing fishery credit programs were beset by very low repayment rates. The most common cases of poor repayment were poor catch due to stiff competition in the fishing grounds, inadequate supervision of credit programs, other demands for cash, dole-out mentality and poor loan collection procedure. Based on lending cost analysis, the viability of the fishery credit programs is seriously threatened by very high loan default, concessionary interest rate and relatively high administrative cost. Unless mitigated by immediate policy reforms and effective recoupment procedures, the present fishery credit programs are likely to continue to fail.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Panayotou, T. ed.]

TITLE [Small-scale Fisheries in Asia: Socioeconomic Analysis and Policy]

SOURCE [1985., 283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

Because of the new ocean regime of extended fisheries jurisdictions, governments of developing countries in Asia, and elsewhere, face a unique opportunity for upgrading their depressed coastal fisheries to take advantage

of their enlarged resource base. This volume is a partial response to the resulting need for a better understanding of the constraints and opportunities facing small-scale capture and culture fisheries from five Asian countries - Bangladesh, Malaysia, Philippines, Sri Lanka, and Thailand - based on original field research sponsored by the International Development Research Centre. Among the subjects covered are socioeconomic conditions, productivity and economic efficiency, cost structure and profitability, marketing, social and institutional constraints, and government programme. The authors conclude that the scope for further fisheries development is strictly limited to the size of the resource. The success of any fisheries development scheme will be determined by the effectiveness of management schemes taken currently with development of controls on entry into the fishery. Improvements in resource productivity and in living standards could come about only if fishery-related interventions are complemented by rural development on a broader resource base.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situations)]

AUTHOR [Panayotou, T. (ed.)]

TITLE [Small-scale Fisheries in Asia: Socioeconomic Analysis and Policy]

SOURCE [1985., 283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Panayotou, T. (ed.)]

TITLE [Small-scale Fisheries in Asia: Socioeconomic Analysis and Policy]

SOURCE [1985., 283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [MARKETING]

AUTHOR [Panayotou, T. (ed.)]

TITLE [Small-scale Fisheries in Asia Socioeconomic Analysis and Policy]

SOURCE [1985., 283 p.]

PUBLISHER [IDRC, Ottawa, Ontario, Canada]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Panayotou, T.]

TITLE [Management Concepts for Small-scale Fisheries: Economic and Social Aspects]

SOURCE [FAO Fisheries Technical paper, (228)., 1982., 53 p.]

ABSTRACT:

This paper provides an analytical framework for the management and development of coastal small-scale fisheries in developing countries. In a brief review the basic management concepts developed for single-species fisheries are presented and their appropriateness is examined for the management and development of small-scale multi-species fisheries. Apart from the higher biological complexity of multi-species fisheries the traditional management concepts also need refinement for socio-economic reasons. The paper describes the constraints under which many small-scale fishermen operate, viz, resource limitation, conflicts with large-scale fisheries, lack of geographical and occupational mobility and lack of alternative employment opportunities. These constraints may temporarily call for higher levels of fishing effort than justifiable from a pure economic efficiency point of view. Still, any long-term improvements in the living standard of small-scale fishermen will necessitate some forms of human intervention, which allocate the resource between different sections of the fishing industry and in general limit the expansion of fishing effort to prevent wastage of capital and human resources. The paper discusses various measures to regulate fishing effort in small-scale fisheries, viz, selectivity of gear; seasonal and area closures, catch quotas; limits on the number of fishing units, on the quantity of gear or on the catching capacity of vessels; economic controls such as taxes, royalties or license fees; and resource allocation through territorial rights. The choice among these management alternatives should be based on a set of criteria which include: acceptance by the fishermen, gradual implementation, flexibility, encouragement of efficiency and innovation, full cognizance of regulation and enforcement costs, and due attention to employment and distributional implications. Owing to the the geographically dispersed nature of artisanal fisher folk settlements, the revival and rejuvenation of traditional territorial community rights over coastal resources offer perhaps the best possible management option for small-scale fisheries. Instead of attempting to control fishing directly, such rights aim at creating a conducive environment of self-control by the fishermen themselves. The paper concludes with a presentation of some examples of

traditional territorial fishing rights in Brazil, Japan, Sri Lanka and Ivory Coast.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Pauly, D., G. Silvestre and I.R. Smith]
 TITLE [On Development, Fisheries and Dynamite: A Brief Review of Tropical Fisheries Management]
 SOURCE [Natural Resource Modelling 3(3):1-25., 1989.]

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Pauly, D., Mines, A.M. (eds.)]
 TITLE [Small-scale Fisheries of San Miguel Bay, Philippines: Biology and stock assessment]
 SOURCE [ICLARM Technical Report No. 7, Institute of Fisheries Development and Research, Quezon City, Philippines., 1982., 124 pp.]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [artisanal fishing, stock assessment, fishery biology]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]
 ABSTRACT:
 The report analyses the biological aspects of the fisheries of San Miguel Bay representing the results of data collection and analysis over approximately a 2-year period, 1979-81. Abstracts of 8 papers are cited individually.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Pauly, D., Murphy, G.I.]
 TITLE [Theory and Management of Tropical Fisheries. Proceedings of the ICLARM/CSIRO Workshop on the Theory and Management of Tropical Multispecies Stocks, 12-21 January 1981, Cronulla, Australia]
 SOURCE [ICLARM Conf. Proc., no. 9, ICLARM, Manila, Philippines, 1982., 360 pp.]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [tropical zones, fishery management, conferences, multispecies fisheries]
 ABSTRACT:
 * see previous entry

SECTION [PRODUCTION AND EFFICIENCY]

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situations)]

AUTHOR [Pauly, D.]

TITLE [The Fishes and their ecology, p. 15-33]

SOURCE [Small-scale Fisheries of San Miguel Bay, Philippines: Biology and Stock Assessment (eds. D. Pauly and A.N. Mines), ICLARM Technical Report 7., 1982., 124 p.]

PUBLISHER [IFDR/CF/UPV, Quezon City, ICLARM, Manila; and UNU, Tokyo, Japan]

ABSTRACT:

An annotated list of 188 fishes recorded from San Miguel Bay, Philippines is presented. Of these, 48% are marine species. The most abundant fishes belong to marine species whose representatives are known to seek brackish waters, especially when young. Such fish found characterizes San Miguel Bay as an estuary. A brief discussion follows of the distribution with regard to salinity of the Philippine fish fauna as a whole.

The fish species of San Miguel Bay can be arranged into the following tropical groups: piscivores (23%), zooplanton feeders (18%), meiobenthos feeders (22%) and macrobenthos feeders (37%). The same ichthyofauna can also be split into the following groups: coastal pelagics (22%), oceanic pelagics (3%), soft-bottom demersals (55%) and reef/hard-bottom demersals (20%). The role of the bay as a nursery ground for fishes is discussed.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situations)]

AUTHOR [Pauly, D., A.N. Mines and N.A. Navaluna]

TITLE [Catch and Effort in the Small-scale Fisheries, p. 56-64]

SOURCE [Small-scale fisheries of San Miguel Bay: Biology and stock assessment., (eds. D. Pauly and A.N. Mines) ICLARM Technical Report 7., 1982., 124 p.]

PRODUCER [IFDR/CF/UPV, Quezon City, ICLARM, Manila and UNU, Tokyo, Japan]

ABSTRACT:

The gears used by the small-scale fishermen of San Miguel Bay, Philippines are presented and classified. Numbers around the Bay and catch per effort of these various gears are estimated, along with their annual fishing effort.

San Miguel Bay catches by gear type and species groups are presented. The estimated total annual catch of fish and crustaceans from the San Miguel Bay small-scale fishery (excluding all types of trawlers) is 7,760 t or 9.2 t/km sq.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situations)]

AUTHOR [Pauly, D., Mines, A.N. (eds.)]

TITLE [Assessment of the Fisheries: Objectives and Methodology]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Biology and stock

Assessment., ICLARM Technical Report No. 7., 1982., pp. 1-4]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, stock assessment, fishery biology]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]

ABSTRACT:

San Miguel Bay is a major fishing ground on the Pacific Coast of the Philippines. The bay is exploited by trawler operators and small-scale fishermen competing for the same resources. A multidisciplinary research project involving fishery biologists, economists and sociologists has conducted from 1979 to 1981 to obtain a factual base from which options for the management of the Bay's fishery - including the allocation of its catch - could be derived. This paper, which presents the objectives and methodology of the biological section of the project, serves as a background to seven other papers, which discuss aspects of the Bay, its fishes and fisheries.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates)]

AUTHOR [Pauly, D., Mines, A.N. (eds)]

TITLE [History and Status of the San Miguel Bay Fisheries]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Biology and Stock Assessment., ICLARM Technical Report No. 7, 1982., pp. 95-124]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, stock assessment, trawling, fishery data]

GEOGRAPHIC DESCRIPTORS [Historical account, ISEW, Philippines, San Miguel Bay]

ABSTRACT:

This paper reviews the available data on San Miguel Bay fisheries and their history, and contrasts "small-scale" and "trawl" fisheries, each of which land about half of the bay's total catch of 15,000 t/year. On the basis of historical trawl data, it is shown that the trawlable biomass in the Bay declined in the period from 1947 to 1980/81 to less than 20% of its original value, while total effort by the motorized fleet increased by more than 150 times from 120 horsepower in 1936 to the present value of 18,800 hp.. The catch data and other relevant information are reviewed by the taxonomic group and by gear type. The available evidence suggests that the bay is overfished in the sense that an increase in effort by catch from the San Miguel Bay fisheries as a whole, but rather exacerbate the present allocation problems between the small-scale and trawl fisheries.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Pauly, D., Mines, A.N.]

TITLE [Catch and Effort in the Trawl Fishery]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Biology and Stock Assessment., ICLARM Technical Report., no. 7, 1982., pp. 65-94]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [trawling, catch/effort; stock assessment]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]

ABSTRACT:

The trawl fishery of San Miguel Bay, Philippines, consists of 30 large trawlers operating occasionally in the Bay and 20 medium (3 to 6 t) and 75 small trawlers (2.5 to 2.9 t) whose total annual catch amounts to about 6,500 t, or 7.7 t/km super (2). Using the swept-area method, a fishing mortality of 3.55 (per year) was estimated to be applied by trawlers on the fish stocks of the Bay, which suggests overfishing. This finding is corroborated by comparison with the data from a trawl survey conducted in the Bay in July 1948 which indicates that the portion of the stock accessible to trawlers now represents less than 20% of the 1948 standing stock.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Pauly, D., Mines, A.H. (eds.)]

TITLE [Morphometrics, biology and population dynamics of the croaker fish, *Otolithes ruber*.]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Biology and Stock Assessment.. ICLARM Technical report., no. 7, 1982., pp. 38-55]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [population dynamics, morphometry, stock assessment]

BIOLOGICAL DESCRIPTORS [*Otolithes ruber*]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]

ABSTRACT:

Morphometric data on the San Miguel Bay, Philippines population of the demersal fish *O. ruber* are presented and discussed. Length frequency data referring to the periods 1958-61 and 1980-81 were analyzed in detail, using a computer-based method. The results suggest that in the last 20 years the growth of *O. ruber* has not changed much but that the total mortality has increased markedly. Total standing stock and spawning stock were estimated, based on present catch data and estimated fishing mortality. Annual egg production and egg to recruit mortality were estimated, based on calculated fecundity and available information on spawning periodicity. A yield-per-recruit analysis was performed, which suggests that the *O. ruber* stock in San Miguel Bay is overfished.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Pauly, D., Murphy, G.I., (eds.)]

TITLE [Theory and Management of Tropical Fisheries. Proceedings of the ICLARM/CSIRO Workshop on the Theory and Management of Tropical Multispecies Stocks, 12-21 January 1981, Cronulla, Australia]

SOURCE [ICLARM Conference Proceedings, no. 9, ICLARM, Manila, Philippines, 1982,

360 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [tropical zones, fishery management, conferences,
multispecies fisheries]

ABSTRACT:

Abstracts of the 15 papers included in the proceedings are cited individually.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Perez, E.R.]

TITLE [Conservation Activities and Law Enforcement Measures for
Municipal Fisheries]

SOURCE [Fisheries Today., 1980., vol. 3, no. 2, pp. 8-10]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery regulations, resource conservation]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

Some policies and regulatory measures for the use and protection of fishery resources in the Philippines are cited.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Perez, E.R.]

TITLE [Fishery Management under the New Regime of the Sea: Policies,
Action Plan]

SOURCE [Fisheries Today., 1982., vol. 4, no. 1., pp. 20-25]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery management, fishery regulations, fishery
policy]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

Following the Philippines' declaration of its 200-mile EEZ and the increasing number of unilateral declarations of 200-mile EEZ by coastal states, a policy package was prepared incorporating new development objectives enunciated in the Integrated Fisheries Development Plan for the 1980's; policy recommendations and priority tasks were identified and additional comments and recommendations elicited from relevant agencies. Overall objectives for management and development are listed; proposed policies for fishing operations involving foreign participation and their rationale are outlined, and surveillance and enforcement briefly noted.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Philbrick, C.E.]

TITLE [Analysis of the Commercial Fishery of the Central Philippine Province of Marinduque. Unpublished Thesis (MS), University of Rhode Island, USA]

SOURCE [1987., 139 p.]

ABSTRACT:

This study provides an assessment of the commercial fishery of the Central Philippines Province of Marinduque. No previous fisheries studies have been done in this province despite concerns of overexploitation and simultaneous fishery development efforts. The commercial fishery was chosen for investigation because it is the only sector with available time-series data on catch, effort and income.

Pelagic fish stocks appear to be under heavy exploitation. Catch per unit effort has declined, as effort and efficiency increased between 1970-1985. The average size of the dominant species in the catch indicated that most were juveniles.

The annual average income of the fishermen is well below the poverty line and has been shrinking during the period of study. The daily share of fish that crew members are allowed to keep is a significant component of their total income. Despite considerable financial and technical inputs to the fishery, few if any of the development objectives have been achieved.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Philbrick, C.E.]

TITLE [Analysis of the Commercial Fishery of the Central Philippine Province of Marinduque. Unpublished Thesis (MS), University of Rhode Island, USA]

SOURCE [1987., 139 p.]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates)]

AUTHOR [Philbrick, C.E.]

TITLE [Analysis of the Commercial Fishery of the Central Philippine Province of Marinduque. Unpublished Thesis (MS), University of Rhode Island, USA]

SOURCE [1987., 139 p.]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [MARKETING]

AUTHOR [Piansay, E.Z., dela Cruz and M. Lizarondo]

TITLE [Marketing Operation of Sustenance fishermen in Camarines Sur]

SOURCE [Marketing Research Report I (1)., 1979., 69 p.]

PUBLISHER [BAECON]

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Pichay, L.B.]

TITLE [The Impact of Rising Fuel Costs on Municipal Fisheries]

SOURCE [Fisheries Today., 1980., vol. 3, no. 2, pp. 6-7]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery development, oil industry, fuels, fishery
economics, marine fisheries]

GEOGRAPHIC DESCRIPTORS [Philippines]

ABSTRACT:

The comparative wholesale prices and % increases of regular gasoline and diesel in the Philippines are listed from 1972 to 1980. Some implications and considerations regarding the effects of the oil crises on the fishing industry are discussed.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Pichay, L.B., Conanan, C.B.]

TITLE [Fit for the Times, Alternative Fuel Sources and Energy-saving Devices for
Municipal Fishing Crafts]

SOURCE [Fisheries today., 1983., vol.5, no. 1, pp. 23-27]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishing vessels, fuels, fishery economics, artisanal
fishing]

GEOGRAPHIC DESCRIPTORS [cost analysis, ISEW, Philippines]

ABSTRACT:

Fuel heavily influences almost every fishery-related activity from production and processing to transport and distribution. Cost analyses are made of sample engines running on gasoline, kerosene and diesel and also auxiliary devices that aim to save on operating costs, for use by artisanal fishermen in the Philippines.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Posadas, B.C., Tarrosa, M.C.L., and Alminaza, T.E.C.]

TITLE [Social and Economic Analysis of Hulbot-hulbot Fishing in Iloilo, Philippines]

SOURCE [Asian Fisheries Social Science Research Network Research report, Iloilo City, UPV-AFSSRN Team., 1987]

ABSTRACT:

The general objective of this research project was to assess the social and economic impact of the hulbot-hulbot fishing method. After two field reconnaissance conducted by the project staff, at least 225 hulbot-hulbot fishing units and 136 owners were identified operating in the municipalities of the province of Iloilo as of June 1986.

The living conditions of the hulbot-hulbot fishing households were compared with those of the baby trawl and other small-scale fishing households. The effects of location, assets owned and household size on their living conditions were verified.

The technical aspects of hulbot-hulbot fishing were also presented. The fishing vessel, fishing gear, fishing crew, fishing operation, fishing grounds, fishing seasons, fish species caught and catch composition were described.

Some barriers to entry to hulbot-hulbot fishing were identified as lack of capital, fishing equipments, fishing crew, reluctant attitude of owners and mesh size regulation. The costs and returns from hulbot-hulbot fishing were also estimated. This analysis covered cost structure, sharing pattern and profitability. Variations in the cost structure were compared by location and vessel size.

The average catch reported by the fishermen was 49 kg/trip consisted of 66-88% major species and 12-22% trash fish species. Variations in fish catch in different locations, mesh sizes, vessel sizes, number of crew and hauls were verified.

An average economic profit from hulbot-hulbot fishing of P44/trip was estimated. Variations were evaluated according to location, mesh size and vessel size. Some differences were noted in net income sharing between the owner, pilot and ordinary crew member in the three locations.

The responsiveness of pure profits to changes in catch, price and costs, was measured through the use of sensitivity analysis. A comparative costs and returns analysis between hulbot-hulbot and baby trawl fishing showed very little variations.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Posadas, B., N. Ty and E. Seraspe]

TITLE [Fish Consumption in Iloilo: A Consumer Profile and Behavior Study, pp. 179-210]

SOURCE [Resources, Management and Socio-economics of Philippine Marine Fisheries., (eds. D. Pauly, J. Saeger and G. Silvestre)., Department of Marine Fisheries, Fisheries Technical Report 10., 1986., 217 p.]

ABSTRACT :

This study presents the results of a survey of consumer preferences

with respect to fish carried out in the coastal municipalities in Iloilo province in 1983-84. A detailed socio-economic profile of the rural and urban households of the three municipalities is followed by an analysis of consumer attitudes, preferences and consumer behavior. In the final section, demand functions are derived and discussed.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Rabana1, H.R.]

TITLE [Philippines. Small-scale Fisheries Development in the Philippines: Survey of Prospective Sites and Relevant Fishery Activities.]

SOURCE [FAO/UNIDP, Manila (Philippines), 1985., 85 pp]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishery products, fishery development, fishery economics]

GEOGRAPHIC DESCRIPTORS [Philippines, development projects]

ABSTRACT:

The role of small-scale fisheries regionally, and for the Philippines, in particular, in the production of fishery products is discussed. The depressed economic conditions of small-scale fisheries population is described and analyzed. Two prospective areas which can be used as possible pilot demonstration sites for development: Northern Samar and Sorsogon provinces are discussed in more detail and project proposals prepared for each area. Other sites previously studied are also listed and new prospective development sites are also enumerated. The relevant fishery activities in the different sites identified are cited. Recommendations for the appropriate development framework and institutions are also summarized.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Rau, N.]

TITLE [A Report on the Small-scale Fishery of Mactan Island (Cebu Province, Philippines)]

SOURCE [Raucon, Moackmuehl (FRG)., 1981., 20 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery surveys; artisanal fishing; sociological aspects; fishermen]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, Mactan I]

ABSTRACT:

A report on the small-scale fishery of Mactan Island is presented. Information covers the infrastructure, fisheries and socio-economics of the island.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Roldan, R.G.]

TITLE [Small Fishermen Coast Along with Age-old Problems]

SOURCE [Fisheries Today., 1980., vol. 3, no. 2, pp. 1-2]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [Artisanal fishing; fishery development; sociological aspects; fishermen]

GEOGRAPHIC DESCRIPTORS [Philippines]

ABSTRACT:

This article briefly discusses the basic, causative factors to poverty and low income of Filipino smallscale fishermen.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Roldan, R.G.]

TITLE [Small Fishermen Coast Along with Age-old Problems]

SOURCE [Fisheries Today., 1980., vol. 3, no. 2, pp. 1-2]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishery development, sociological aspects, fishermen]

GEOGRAPHIC DESCRIPTORS [Philippines]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Saeger, J.]

TITLE [Do Trawling Bans Work in Tropical Waters?]

SOURCE [ICLARM Newsletter., 1980., vol. 4, no. 1, pp. 3-4]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery regulations, resource conservation, trawling, fishery resources]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, Samar Sea]

ABSTRACT:

The biological effect of fishing bans in tropical waters is considered. In the Philippines, the Samar Sea was closed to trawlers in November 1976; a fishery survey was carried out to monitor possible changes in the fish stocks. In spite of the ongoing activities of a few small trawlers, the biomass of fish in the Samar Sea increased constantly during the survey period. Thus, it

is concluded that the imposition of a trawling ban is a suitable tool in tropical waters to protect the vital interests of the sustenance fishery by helping heavily exploited fish stocks to recover.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Saeger, J.]

TITLE [Do trawling Bans Work in Tropical Waters?]

SOURCE [ICLARM Newsletter, 1980., vol. 4, no. 1, pp. 3-4]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery regulations, resource conservation, trawling, fishery resources]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, Samar Sea]

ABSTRACT:

* see previous entry

SECTION [PRODUCTION AND EFFICIENCY...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Sagun, R.B. de and Bautista, R.S.]

TITLE [Updated Index to Presidential Decrees of Fisheries. Revised.]

SOURCE [BFAR, Manila, Philippines., 1982., 123 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [marine fisheries, fishery regulations]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

The index on the existing fishery laws, rules and regulations from November 9, 1979 to post-martial law period in the Philippines. It is intended as a reference on fisheries policies as enunciated in presidential decrees, letter of instructions, presidential proclamations, executive orders and the implementing rules and regulations.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Santos, A.B.]

TITLE [Relevant Laws on Municipal Fisheries. Revised edition]

SOURCE [BFAR, Manila (Philippines), 1982., 85 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishery regulations]

GEOGRAPHIC DESCRIPTORS [fishery policy, ISEW, Philippines]

ABSTRACT:

This edition consists of presidential decrees, executives orders, letters of instructions, a provincial circular and the related laws, rules and regulations affecting municipal fishing and/or fisheries designed to give the Philippine municipal small-scale fishermen in rural communities an insight into the government's concern for them and at the same time to provide the coastal sangguniang bayans a working knowledge on the enactment of sound municipal fishery legislation.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Silvestre, G.T. and G. Ganaden]

TITLE [Status of Philippine Demersal Stocks: An Overview]

SOURCE [Paper presented at the National Workshop on Fisheries Policy

and Planning , 16-20 March 1987, Baguio City., BFAR/UNDP/FAO., 1987]

ABSTRACT:

The fishery based on demersal stocks (i.e fishes and invertebrates living on or close to the sea bottom, both soft and hard coral grounds) has contributed a considerable portion (25-40%) of Philippine Marine landings since the 40's. Demersal landings showed a steady increase from 78,000 mt in 1947 to 416,000 mt in 1975. Landings after 1975 decreased steadily until 1980 (328,000 mt), but an upward trend has been noted lately with 1984 landings totalling 385,000 mt. The demersal fishery is considerably area-limited, the productive shelf area (0-200 m depths) comprising only 13% or 225% sq km of the country's vast marine waters.

Currently available information pertaining to the potential yield and state of exploitation of Philippine demersal resources indicate the following: 1) MSY of the demersal stocks is about 800 - 200 thousand mt/yr, the lower limit of which has been essentially reached by present landings; 2) harvests have largely reached the limits that the resources can sustain in the nearshore areas, especially the traditional fishing grounds, and 3) future increases in demersal landings would come primarily from the Palawan, Tawi-Tawi and Lamon Bay areas, as well as from better management of the demersal fisheries. Although the data utilized in making the above conclusions have been criticized as inadequate, more recent and reliable area-specific studies confirm the prevalence of biological and economic overfishing of nearshore demersal stocks. The economic loss (i.e rent dissipation) resulting from lack of management of the demersal fisheries could be as much as US\$ 90 million annually.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Silvestre,G.T.]

TITLE [Assessment of the Multispecies Demersal Stock of the Samar Sea,
Philippines]SOURCE [Technical Report Department Marine Fisheries, University of the
Philippines, Visayas, No. 7, 65 p.]

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Smith, I.R., Mines, A.N. (eds.)]

TITLE [Implications for Equity and Management]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of
Production and marketing., ICALRM Technical report., no. 8, 1982.,
pp. 130-143]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery economics, marine fisheries, fishery management]

GEOGRAPHIC DESCRIPTORS [economic analysis, ISEW, Philippines, San Miguel Bay]

ABSTRACT:

The economic efficiency and distribution of benefits from the fisheries of San Miguel Bay, Philippines are examined. The total annual value of catch from the bay in 1980-81 was estimated to be P53.5 million (US\$ 6 million). Small trawlers, which represented only 3% of the fishing units and employed 7% of the labor force were found to earn the largest shares of total catch value and 50% of the P3 million pure profits, or resource rents. The open-access equilibrium of this fishery has not been reached but further increases in fishing effort would reduce economic efficiency and resource rents. Attention is drawn to the divergence between goals of economic efficiency and equity.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Smith, I.R., Mines, A.N. (eds.)]

TITLE [Costs and Earnings of Cabusao Stationary Gears]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of
Production and Marketing., ICLARM Technical Report., no. 8, 1982.,
pp. 45-60]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery economics, fishing gear, artisanal fishing]

GEOGRAPHIC DESCRIPTORS [economic analysis, ISEW, Philippines, San Miguel Bay]

OTHER DESCRIPTORS [stationary gear]

ABSTRACT:

Costs and returns of three major stationary gears of Cabusao, San Miguel Bay, Philippines are analyzed. The gears discussed include fish corrals,

liftnets and filter nets. Systems for allocation of fishing rights are presented and the returns of capital and labor determined based on the sharing system practiced for each gear. During the observation period, the fish corrals and filter nets earned pure profits in excess of their opportunity costs and the liftnets incurred pure losses.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R., D. Pauly and A.N. Mines.]

TITLE [Small-scale Fisheries of San Miguel Bay, Philippines: Options for Management and Research.]

SOURCE [ICLARM Technical Report 11., 1983., 80 p.]

PUBLISHER [IFDR/CF/UPV, Quezon City; ICLARM, Manila; and UNU, Tokyo, Japan]

ABSTRACT:

This report synthesizes the respective research findings of the biology, economics and sociology modules of a multidisciplinary study of the small-scale fisheries of San Miguel Bay, Philippines and examines various options for management of this very productive multispecies multigear fishery. The report highlights 1) the lack of potential for further expansion of the fishery; 2) the competition in resource use that prevails between 2,300 small scale gears on the one hand, and 95 trawlers on the other hand; 3) the highly skewed distribution of benefits from the fishery between these two groups; and 4) the limited alternative employment opportunities available locally to the majority of the Bay's small-scale fishermen.

The need for the creation of management institutions and mechanisms that control the level of effective fishing effort in the Bay and that address the equity issues related to distribution of benefits from the fisheries is stressed. The trade-offs among various management options, including those that limit the fishing effort of trawlers, are explored. It is recommended that a San Miguel Bay Fisheries Management Authority be established and that fishermen participate in all decision-making regarding management of the Bay's resources. Finally, the methodologies used for data collection and interpretation during the course of the study are discussed in the context of the information requirements necessary for managing a complex fishery such as that in San Miguel Bay.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Smith, I.R., Mines, A.N. (eds.)]

TITLE [Small-scale Fisheries of San Miguel Bay, Philippines: Economics of Production and Marketing]

SOURCE [ICLARM Technical Report., no. 8, Institute of Fisheries Development and Research, Quezon City (Philippines), 1982., 143 p.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishery economics, economic analysis]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]

ABSTRACT:

This research project was designed to determine the distribution of total catch and revenues among major gear types, so that informed decisions regarding possible gear regulations could be made by the Bureau of Fisheries and Aquatic Resources (BFAR) and the municipalities which have responsibility for enforcing fishery regulations in San Miguel Bay and other fishing grounds of the country. The various papers in this report analyze the economic aspects of fisheries production and marketing in San Miguel Bay. It represents the results of data collection and analysis over approximately a two-year period, 1979-1981.

SECTION [MARKETING]

AUTHOR [Smith, I.R., Mines, A.N. (eds.)]

TITLE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of Production and Marketing]

SOURCE [ICLARM Technical Report no. 8, Institute of Fisheries Development and Research, Quezon City, Philippines, 1982., 143 p.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishery economics, economic analysis]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Smith, I.R., Mines, A.N. (eds.)]

TITLE [Costs and Returns of Small and Medium-sized Trawlers]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of Production and Marketing., ICLARM Technical report., no. 8, 1982., pp. 78-94]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [trawlers, fishing vessels, fishery economics]

GEOGRAPHIC DESCRIPTORS [economic analysis, ISEW, Philippines, San Miguel Bay]

ABSTRACT:

Small and medium-sized trawlers are among the more recent gear innovations in San Miguel Bay, Philippines. This paper examines the economics of these two types of trawlers. Investment and operating costs of each type are presented and the various sharing systems are used to determine the income of owners and the crewmen. These incomes are compared with their respective opportunity costs. Small trawler fishing units were found to be earning

significant profits in excess of their opportunity costs. Reasons for the difference between economic performance of the two trawler types are discussed. Finally, the paper discusses means by which the trawler owners attempt to increase their profits and minimize risks through crew selection and management, choice of landing site, and ownership of more than one fishing unit.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R. and Panayotou, T.]
 TITLE [Territorial Use Rights and Economic Efficiency: The Case of the Philippine Fishing Concessions]
 SOURCE [FAO Fisheries Technical Paper /FAO, Dbc. Tech. PECHES/FAO, Doc. Tec.PESCA., no. 245, 1984., 17 pp.]
 TEXT LANGUAGE [English, Spanish, French]
 SUBJECT DESCRIPTORS [artisanal fishing, fishing rights, fishery economics, fishery management]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]
 ABSTRACT:

This paper discusses the mechanics and implications of municipal concessions in the Philippines which govern the use of municipal waters for fish corrals, oyster culture beds and gathering of milkfish fry. These concessions or territorial use rights are awarded annually by the resource owner (the municipality) to the highest bidder. In the case of milkfish fry gathering, the concessionnaire assumes monopsonist rights of first purchase from fry gatherers. The implications of this system for economic efficiency and equity are discussed theoretically with supporting data from milkfish fry concessions in Antique province. It is concluded that the system increases economic efficiency in resource use and generates significant income for municipalities which they can then redistribute as they see fit, and therefore not necessarily for the special benefit of fishermen.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Smith, I.R., Mines, A.N. (eds.)]
 TITLE [Gill-netters: Costs, Returns and Sharing Systems]
 SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of Production and Marketing., ICLARM Technical Report., no. 8, 1982., pp. 27-44]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [fishery economics, gillnets, artisanal fishing]
 GEOGRAPHIC DESCRIPTORS [economic analysis, ISEW, Philippines, San Miguel Bay]
 ABSTRACT:

The paper analyzes the costs and returns for gill-netters, the major

small-scale fishing gear in terms of numbers of units and fishermen employed, operating in San Miguel Bay, Philippines. The analysis is based on investment costs and daily fishing trip data collected between June 1980 and May 1981 from a sample of gill-netters based in Cabusao, Camarines Sur. The 20-sample fishing unit made a total of 4,680 fishing trips during this period. Gill-net operation is described; its seasonality, species caught and fishing areas are discussed. The most commonly used sharing arrangements between owner and crew are illustrated to determine the returns to capital and labor in the gill-net fishery. Finally, production functions are used to explain variations in monthly catch. Eighty four per cent of the variation in monthly catch of the gill-netters can be explained by the number of fishing trips and gasoline expenditure per trip.

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R., Mines, A.N.]

TITLE [Institutional and Technical Aspects of Access to Municipal Fishery Resources]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Socio-economics of Production and Marketing., ICLARM Technical Report., no. 8., 1982., pp. 95-103]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fishery management, artisanal fishing, allocation systems, fishery disputes]

GEOGRAPHIC DESCRIPTORS [fishery policy, trawling, ISEW, Philippines, San Miguel Bay]

ABSTRACT:

This paper examines the role of techniques and institutions in resource use. Two patterns of technical change have emerged with the increasing population pressure on fishery resources in San Miguel Bay, Philippines. The first intensification of resource exploitation in the relatively congested barrios at the mouth of the Bicol River. This is linked to the availability of capital from the marketing sector in these barrios. The second pattern is the expansion of exploitation (using less capital-intensive gear) to the less accessible communities along the bay. With respect to institutional change, growing interdependencies have resulted in friction among fishermen (especially between small-scale non-trawl fishermen and trawler operators). This has led to more regulation of the fishery. Specific policy options concerning less dependence on intensification and emphasizing decentralization of enforcement are presented.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Smith, I.R., Mines, A.N. (eds.)]
 TITLE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of Production and Marketing]
 SOURCE [ICLARM Technical Report no. 8, Institute of Fisheries Development and Research, Quezon City, Philippines, 1982., 143 p.]
 TEXT LANGUAGE [English].
 SUBJECT DESCRIPTORS [artisanal fishing, fishery economics, economic analysis]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]
 ABSTRACT:
 * see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [MARKETING]

AUTHOR [Smith, I.R., Mines, A.N.]
 TITLE [Economic Aspects of Processing and Marketing]
 SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of Production and Marketing., ICLARM Technical Report., no. 8, 1982., pp. 104-129]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [fishery economics, processing fishery products, marketing, pricing, artisanal fishing]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]
 ABSTRACT:
 This paper examines the pricing efficiency and related economics of fish processing and marketing in two communities of San Miguel Bay, Philippines. Salting, dried fish processing and marketing and fresh fish marketing are covered. Pricing efficiency of the system was found to be low. Daily incomes for marketing intermediaries, except for a few large-scale wealthier fish driers, were comparable to those earned by fishing households in the communities. It is argued that the best hope for improving processing and marketing in these communities lies in group activities that manage gasoline supply and processing to compete with existing suppliers and processors. Finally, recommendations for uniform weights and measures are made.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Smith, I.R., M.Y. Puzon and C.N. Vidal-Libunao]

TITLE [Philippine Municipal Fisheries: A Review of Resources Technology and Socio-economics]

SOURCE [ICLARM Studies and Reviews 4., 1980., 87 p.]

PUBLISHER [ICLARM and FIDC, Manila]

ABSTRACT:

Recent research findings related to the technology and socioeconomics of small-scale municipal fishermen in the Philippines and the "open-access" resources they exploit are reviewed. Evidence is provided of a trend towards over-fishing of Philippine coastal waters, and of willingness among fishermen to consider alternative activities to capture fishing.

Also documented is the encouraging shift in the emphasis in government programs from a resource "development" orientation to one of resource "management". The review concludes with a discussion of the implications of these research findings to fisheries management and research.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Smith, I.R., A.N. Mines and G. Banacia]

TITLE [The Research Site, Data Collection and Methods of analysis]

SOURCE [Small-scale Fisheries of San Miguel Bay, Philippines: Economics of production and marketing., ICLARM Technical Report., no. 8, 1982., p. 1-26]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [artisanal fishing, fishery economics, economic analysis]

GEOGRAPHIC DESCRIPTORS [methodology, ISEW, Philippines, San Miguel Bay]

OTHER DESCRIPTORS [economic survey]

ABSTRACT:

Objectives, sampling and analytical methods and data collection methodology of an economic survey of the small-scale fishery of San Miguel Bay, Philippines, are discussed. The fishing community from which the majority of economic data were gathered is described. (Produced in cooperation with: The Institute of Fisheries Development and Research; International Center for Living Aquatic Resources Management, Manila (Philippines); and the United Nations University, Tokyo, Japan.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Smith, I.R.]

TITLE [The economics of the Milkfish Fry and Fingerling Industry of the Philippines]

SOURCE [ICLARM Technical report., no. 1 ICLARM/SEAFDEC Manila, Philippines, 1981., 148 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [fish culture, fishery economics, fry, aquaculture development, seed collection]

BIOLOGICAL DESCRIPTORS [Chanos-chanos]

GEOGRAPHIC DESCRIPTORS [Philippines]

ABSTRACT:

The purpose of this study was to evaluate allegations regarding imperfections in the Philippine fry industry and to determine the effects of related fisheries policies. This technical report is the first of several that deal with the economics of various aspects of milkfish. Chanos-chanos, industry. It concentrates on the fry and fingerling industries in the Philippines.

SECTION [COST STRUCTURE AND PROFITABILITY]

AUTHOR [Smith, I.R., Mines, A.H. (eds.)]

TITLE [Costs and Earnings of Mini Trawlers]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of Production and Marketing., ICLARM Technical report., no. 8, 1982., pp. 64-77]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [trawlers, fishery economics]

GEOGRAPHIC DESCRIPTORS [economic analysis, Philippines, San Miguel Bay]

ABSTRACT:

Mini trawlers are the smallest trawlers operating in San Miguel Bay, Philippines. This paper examines the costs and earnings of this type of gear and offers explanation for the high pure profits earned. Variations in catch and incomes are related to differences in the various sharing systems and to variations in fishing effort.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Smith, I.R. and O. Solon]

TITLE [Economic Effects of Overfishing in San Miguel Bay, Philippines. p. 196-203]

SOURCE [Indo-Pacific Fishery Commission. Papers presented at the Symposium on the Exploitation and Management of Marine Fishery Resources in Southeast Asia held in conjunction with the Twenty-second Session of the Indo-Pacific Fishery Commission, Darwin, Australia, 16-26 February 1987. RAPA/Report: 1987/10., 552 p.]

ABSTRACT:

The San Miguel Bay in Southern Luzon Island, Philippines is a large estuarine with heavy concentrations of both trawl and non-trawl gears. The Bay was the site of an intensive interdisciplinary investigation by researchers in the late 1970's and early 1980's who documented the high catches from the Bay, the extreme competition that existed between large numbers of trawl and non-trawl gear types, and the concentration of benefits from the fishery in the hands of only a relatively small number of families. It was clear at that time that controls over levels of fishing effort and certain types of gears were necessary.

Five years later in 1986, the Bay still is characterized by extreme competition from an even larger number of competing vessels and fishermen. The number of trawlers has increased by over 50 per cent since 1981 and non-trawl fishermen using non-motorized vessels have similarly increased. Rates of out migration have picked up, especially amongst young adults. Fishermen organizations have become more vocal in their suggestions that the Bay be closed to all trawling. These suggestions have now been officially endorsed by the local fisheries office and for the first time it appears that legal and institutional support or measures to benefit the majority of the Bay's fishermen will now be forth coming.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Smith, I.R., M.Y. Puzon and C.N. Vidal-Libunao]

TITLE [Philippine Municipal Fisheries: A Review of Resources Technology and Socioeconomics]

SOURCE [ICLARM Studies and Reviews 4., 1980., 87 p.]

PUBLISHER [ICLARM and FIDC, Manila]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R., M.Y. Puzon and C.N. Vidal-Libunao]

TITLE [Philippine Municipal Fisheries: A Review of Resources Technology and Socioeconomics]

SOURCE [ICLARM Studies and Reviews 4., 1980., 87 p.]

PUBLISHER [ICLARM and FIDC, Manila]

ABSTRACT:

* see previous entry

SECTION [SOCIOECONOMIC CONDITIONS...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R., Panayotou, T.]
 TITLE [Territorial use rights and economic efficiency: the case of the
 Philippine fishing concessions]
 SOURCE [FAO Fisheries Technology Paper/FAO, Doc. Tech. PECHES/FAO, Doc. Tech.
 pesca., no. 245, 1984., 17 pp.]
 TEXT LANGUAGE [English, Spanish, French]
 SUBJECT DESCRIPTORS [artisanal fishing, fishing rights, fishery economics,
 fishery management]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]
 ABSTRACT:
 * see previous entry

SECTION [PRODUCTION AND EFFICIENCY...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R. and O. Solon]
 TITLE [Economic effects of overfishing in San Miguel Bay, Philippines.
 p.196-203]
 SOURCE [Indo-Pacific Fishery Commission. Papers presented at the Symposium on
 the Exploitation and Management of Marine Fishery Resources in Southeast
 Asia held in conjunction with the twenty-second session of the
 Indo-Pacific Fishery Commission, Darwin, Australia, 16-26 February 1987.
 RAPA/Report: 1987/10., 552 p.]
 ABSTRACT:
 * see previous entry

SECTION [PRODUCTION AND EFFICIENCY...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Smith, I.R., Mines, A.N.]
 TITLE [Implications for equity and management]
 SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Economics of
 Production and Marketing., ICLARM technical report., no.8, 1982.,
 pp.130-143]
 TEXT LANGUAGE [English]
 SUBJECT DESCRIPTORS [fishery economics; marine fisheries; fishery management]
 GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, San Miguel Bay]
 ABSTRACT:
 * see previous entry

SECTION [PRODUCTION AND EFFICIENCY...]

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Spoehr, A.]

TITLE [Change in Philippine Capture Fisheries: An Historical Overview]

SOURCE [Philippine Quarterly of Culture and Society, 12., 1984., pp. 25-56]

PUBLISHER [University of San Carlos, Cebu City]

ABSTRACT:

- can update, complement Smith et. al. (1980) review- covers San Miguel Bay study

SECTION [POLICY AND MANAGEMENT]

AUTHOR [Spoehr, A.]

TITLE [Protein from the sea: technological change in Philippine Capture Fisheries]

SOURCE [Ethnology Monograph No. 3, Dept. of Anthropology., University of Pittsburgh., 1980., 224 p.]

ABSTRACT:

The purpose of the study is to present the change over the last half century in the sample of Visayan fishing technology, viewed in anthropological perspective. The report is based on observation in the central and Western Visayas and is confined to capture fisheries. Field survey began in Cebu in September 1975. Survey extended up to the eastern Cebu Coast and the Bohol Islands, to Iloilo City and the Panay coast north to the town of Concepcion and South and West along the coast as far as San Jose de Concepcion, Capital of Antique province, then to Bacolod City on Negros and West and North coasts of Negros Occidental as far as the town of Sagay Viejo. The following 5 chapters treat different examples of technological change in contemporary capture fisheries in the central and western Visayas.

In each case, an attempt has been made to discuss a given device, how it is used, the changes it has undergone, the work organization employed and other socio-economic aspect associated with the particular technology. The fish corral, non motorized fishing craft, pumpboat, bashig, gill-net and trawls are dealt in these chapters. After which, a chapter on wholesale fish markets shows both the salient characteristics of market place organization and the articulation between the production and exchange sectors in Visayan fisheries. The report concludes with a summary of results and recommendation.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Suzuki, S.]

TITLE [Municipal Fishing Development in a Frontier Village of the Philippines., M.S. Thesis (unpublished)., International University of Japan]

SOURCE [1987., 148 p.]

ABSTRACT:

The objectives of this paper are to understand the factors determining the socioeconomic structure in the fishing barangay (village), characterized as a "frontier" and to analyze the interconnection of these factors in light of the local ecology, geography, technology, market and the role of migratory fishermen.

In this barangay, due to its low impact on the aquatic resources, an ecological balance has so far been well maintained among the factors mentioned above. This is the fundamental reason why the fishermen in this barangay live above subsistence level, although many reports on Filipino fishermen state their life is the poorest of the poor.

In addition, there is a tacit agreement among the people concerned about reciprocity in the barangay. Despite the middlemen play an important role in the local economy, in a way as an exploitative group, their earnings are redistributed in the barangay. This is a stabilizing agent both for themselves and for the fishermen to sustain their standard of living and secure a subsistence rural economy.

Hence, when the ecological balance in the locality is lost, the standard of living falls for both the fishermen and the middlemen. These scarce marine resources are rapidly becoming scarcer because of the increasing number of both local and migrating fishermen.

So far, a facet of municipal fishery development is the expansion of fishing grounds to seek "frontiers". Such frontiers, however, will sooner or later disappear. Unless the government provides job opportunities to the surplus fishermen, prospect for the municipal fishing in the future will be destined to "involution" share the poverty.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Tan, F.A.]

TITLE [An Economic Analysis of Commercial Fishing Operations in the Philippines]

SOURCE [Economics of Aquaculture, sea-fishing and coastal resource use in Asia., eds. A.R. Librero and W.L. Collier., p. 185-199., 1979]

ABSTRACT:

This paper attempts to present some economic aspects of the commercial fishing industry of the Philippines: a) some characteristics of the industry structure, b) factors affecting the level of operational efficiency, c) policy implications of the industry structure and present operational efficiency. The structure of the commercial fishing industry appears to be characterized by a) the presence of a large number of single vessel ownership type of operation; and b) multi-vessel operation based on large vessels operated by a few large operators. In addition, the following dimensions are indicated: a) a concentration of a large portion of catch (40%) landed in Navotas; b) a concentration of large fishing vessels in Navotas; and c) a concentration of operations in about 16 major fishing boat operators based in Navotas.

SECTION [MARKETING]

AUTHOR [Uwate, K.R. and R. Tumaliuan]

TITLE [An Assessment of the Metro Manila Market for Seabass, Bighead carp, and Red tilapia]

SOURCE [1985., 45 p.]

PUBLISHER [Aquaculture Department, SEAFDEC, Tigbauan, Iloilo, Philippines]

ABSTRACT:

Three sectors of the fish market in Metro Manila were surveyed to obtain baseline information on the seabass, *Lates calcarifer*, the bighead carp, *Aristichthys nobilis*, and the red tilapia, *Oreochromis* sp. Specific information was solicited on 1) public awareness of these fishes; 2) current seabass consumption patterns; and 3) market demand for these species. The three sectors surveyed included: 1) retail fish markets, 2) restaurants (that sold fish), and 3) consumer households. The retail fish market sector was more familiar with these key species compared with restaurant and consumer sectors. Each sector provided different reasons as to why these fishes were not purchased. Responses also varied between species. Current consumption of seabass is limited. Only 21 per cent of retail fish markets, nine per cent of restaurants, and 14 per cent of consumer households purchased this fish. Cultured seabass appeared to command higher prices than wild-caught fish. In addition, there was a size price relationship evident in which larger fish commanded higher prices. In the restaurant sector, there is interest in selling live seabass. A rough estimate of market demand was used for these three species. Of the three species, red tilapia appeared to have the highest demand function. However, there is large variance associated with these estimates. If prices of these species were reduced to the current price of milkfish, milkfish demand would be greater than that of the species.

Market information of these three species is documented in this study. A comparison with production economics data is now needed to identify culture systems and species that are highly profitable or can provide the most protein for domestic consumption.

SECTION [MARKETING]

AUTHOR [Valdellon, T.C. and M.S. Lizarondo]

TITLE [An insight into the Marketing operation of Prawn and Shrimp Exporters in the Philippines]

SOURCE [Agricultural Marketing Report VII (14)., 1985., 37 p.]

PUBLISHER [BAECON]

SECTION [MARKETING]

AUTHOR [Valdellon, T.C. and C.A. Parado]

TITLE [Tuna production and Marketing in South Cotabato]

SOURCE [Agricultural Marketing report Vol. VII, No. 19., 1985., 80 p.]

PUBLISHER [BAECON]

ABSTRACT:

The usual fishing grounds in South Cotabato included Moro Gulf, Sarangani Bay, Sibuguey Bay, and Mindanao Sea. All fishermen reportedly used nylon hook and line in catching tuna. April and August were considered best seasons for tuna fishing; the rest of the year proved to be unprofitable.

For tuna alone, the producers obtains positive returns of P 1,318 per fishing activity equivalent to a profit ratio of 0.60. Tuna trading was conducted almost everyday by the retailers; assembler-wholesalers had two times a week; and wholesaler-retailers had four times in a month or 3 to 6 times per week.

Tuna and tuna-like species were primarily for commercial purposes. About 33% of other species were marketed while 77% were for home consumption. 29% of the total catch were negotiated directly to exporters 30% went to local processors and 14% to agents of exporters; the rest (27%) were distributed among the assembler-wholesalers, wholesalers, and retailers. Among trader-respondents, tuna were channeled by assembler-wholesalers either to brokers in other Mindanao provinces, wholesaler-retailers, or retailers before the product reached the end-users. Other intermediaries (retailers) sold to consumers.

Majority of both traders and producers maintain regular buyers and suppliers. Cash and consignment were the prevailing modes of payment to suppliers, among buyers, they extended cash, credit or consignment terms.

The structure of the tuna market in South Cotabato tended to have a monopolistic competition at the fishermen level and the differentiated oligopsony at the trader level.

All the sample fishermen did not engage in exporting tuna, however, most of their catch were directed to the exporters and agents of exporters in the province. Major problems in tuna catching were the sea pirates, weather condition, high costs of subsistence and maintenance, damage to fishing gears, and insufficient knowledge on the breeding season of tuna.

Recommendations of the study includes: (1) information dissemination - price bulletin through broadcast and print media in the province or through daily posting of prevailing prices on bulletin boards in strategic locations to enhance the bargaining position of both the fishermen and the traders; (2) supply of more capital through loans; (3) sea piracy can be controlled if not eradicated by the Philippine Coast Guard and the Philippine Navy; (4) the government (through the Ministry of Agriculture and Food, Ministry of Trade and Industry and the Ministry of Foreign Affairs) should help in easing some restrictive barriers instead of imposing additional burdens/taxes against the commodity.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Villanoy, C.L., Juinio, A.R., Menez, L.A.]

TITLE [Fishing Mortality Rates of Giant Clams (Family Tridachnidae) from the Sulu Archipelago and Southern Palawan, Philippines]

SOURCE [Coral Reefs, vol. 7, no. 1, 1988., pp. 1-5]

ABSTRACT:

Average size frequency distributions of *Tridachna squamosa*, *T. gigas*, *Hippopus hippopus* and *H. porcellanus* harvested from the Sulu Archipelago and Southern Palawan areas from 1978-1985 were derived from export records and a warehouse inventory of giant clam shells. Average species' mortality rates (Z) were estimated and were used to approximate average fishing mortality rates (F) over the period 1978-1985. Crude estimates of exploitation rates (F/Z) indicate that populations of these species are already overexploited. These findings have serious implications in view of the fact that the Sulu Archipelago and Southern Palawan are thought to be the last strongholds of giant clams in Philippine waters.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Villosa, E.P., Aprieto, V.L.]

TITLE [On the Relative Abundance and Distribution of Slipmouths (Pisces Leionathidae) in Lingayen Gulf, Philippines]

SOURCE [Fisheries Resources Journal, Philippines., 1983., vol. 8, no. 1, pp. 26-43]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [marine fisheries, fishery surveys, stock assessment]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

Monthly research cruises on board the M/V Albacors were undertaken in Lingayen Gulf from February 1978 to January 1979. A total of 10,804 kilograms of fish were captured by the otter trawl between 39-90 meters. About 43.2% of the trawl catch consisted of slipmouths caught at an average rate of 21.83 kg/hr. Nine species of slipmouths were identified from the collections. *Leiognathus bindus* (Val.) made up of 97.38% of the slipmouth catch. The estimated stock size and mean stock density of slipmouths in the study area are 637 tons and 577 kg/km², respectively.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Villosa, E.P., Hermosa, G.V., Jr.]

TITLE [Demersal Trawl Fish Resources of Samar Sea and Cari

SOURCE [Fisheries resources Journal, Philippines., 1982., pp. 59-78]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [demersal fisheries, fishery surveys, potential resources, stock assessment]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines]

ABSTRACT:

The demersal trawl survey of the M/V Albacore in Samar Sea area captures total of 52.23 tons of fishes and invertebrates at an average of 172 kgs/hr during the period March 1979-June 1980. The collection consists of commercial fishes, 81.2%; trash fishes, 10.0%; cephalods, 8.2% and crustaceans, 0.62%. Of the 82 fish families identified, only eleven families are considered commercially important, each contributing between 1%-29% of the total catch. The relative abundance, estimated stock density and stock size of major fish groups are given. Survey results indicate an estimated standing stock size of between 10-100 meters.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [White, T.F.]

TITLE [The Philippine Tuna Fishery and Aspects of the Population Dynamics of Tunas in Philippine Waters]

SOURCE [1982., 84 p., ITP/82/WP/5 (SCS/82/WP/114)]

PUBLISHER [Colombo, Indo-Pacific Tuna Development and Management Programme]

ABSTRACT:

The tuna sampling programme was established in the Philippines at the end of 1979 in order to gather basic data on the landings of tuna in that country. Mindanao was selected as the study site as the majority of tunas landed in the Philippines were caught in the surrounding waters particularly at that time. The results suggest that skipjack and yellowfin tuna spawn throughout the year, probably throughout Philippine waters, but particularly in the Moro Gulf/Celebes Sea. This assumption is based upon the size of tunas landed in these areas and their predicted ages. It would appear that the juvenile or "young" tunas remain in the inshore waters until they reach approximately 30 cm in length, at which point they disperse seawards, probably into the Pacific. More than 90% (by number) of all tunas landed in the Philippines are captured during the early phase of their life cycle. The spawning "stock" responsible for the yellowfin recruits is most likely those fish captured by the handline fishery (and longline fishery). These fish are in the 110 to 140 cm size range and probably range in age from 3+ to 4+ years.

It is impossible to detect trends in catch per effort, hence abundance, based on only 2 1/2 years of data. Thus, there is no evidence from the study results to support or refute the claim of overfishing. Data from the study also do not support the claim that the payaos are detrimental to the fishery because they tend to selectively attract smaller individuals. When the majority of the tunas in the area are apparently juveniles, it is true to say that the use of payaos will increase the catch of small tunas, but not selectively. The majority of tunas landed in the Philippines are captured by the ringnet and small purse-seine vessels which use the same gear (mesh size) to catch a variety of other pelagic species, such as sardines, round scad, etc. it is therefore an academic exercise to consider the effect upon the yield of

tunas by raising the average size (age) of tunas by, say, increasing mesh size. Both skipjack and yellowfin tuna are generally captured together by the same vessels using the same gear (with the exception of the payao handline fishery which is specific for yellowfin). Considering these species together, it would appear that the present level of effort in the fishery, considering all gears together is probably slightly less than required to harvest the maximum yield of yellowfin, but close to that required to harvest the optimum yield of skipjack. This conclusion is reached on the assumption that M is probably greater than 0.5 and probably between 1.0 and 2.0.

Decreasing the number of ringnet and smaller purse-seine vessels would result in noticeable improvements in the yield of skipjack by the other gears, but a negligible annual increase in total weight landed. Yellowfin landings would show a negligible change. Increasing the number of these vessels however would result in little overall change in total landings from the present situation for either species.

The yellowfin tuna handline fishery is however somewhat different. Decreasing the number of these vessels would probably result in increased yield from all other gears. However, these increases would be at the expense of the larger adult fish, currently the target species of these handline vessels, and the basis of the sashimi export market. In fact, the benefit obtained from decreasing the number of these vessels is derived from the decreased catch of juveniles used as bait. It will therefore seem most appropriate to investigate alternative baits for these vessels, which would have the same overall effect upon the fishery rather than to suggest producing the number of vessels.

The question is raised of a possible interaction between the surface fisheries of the Philippines based essentially on 0+ fish (, 1 year of age), the surface fisheries in the Pacific based on I+ and II+ fish, some at least of which may be derived from Philippine waters, and II+ and IV+ fish which form the basis of the Philippine handline fishery, itself the basis of the Philippine frozen export industry and provide the spawning stock for the inshore fishery. This question is particularly relevant in view of the present, and more importantly, planned built-up of the Western Pacific purse-seine fleets by the USA, Mexico, Japan, and Korea.

SECTION [PRODUCTION AND EFFICIENCY (Resources and rent estimates situationers)]

AUTHOR [White, T.F. and M. Yesaki]

TITLE [The Status of Tuna Fisheries in Indonesia and the Philippines]

SOURCE [1982., 64 p.]

PUBLISHER [Indo-Pacific Tuna Development and Management Programme., Colombo., ITP/82/WP/3 (SCS/82/WP/112)]

ABSTRACT:

Commercial tuna fishing has developed rapidly during recent years in the Southern Philippines. The initiative for which has come primarily from the private sector. Two related developments during the last decade were responsible for this development in the Philippines. The FB "Southern Ho" and FB "Royal Venture", the tuna purse-seiners chartered by the SCSF adapted the payao technique for their large purse-seine nets and made some impressive catches attracting the attention of the Philippine fishing industry. The local fishermen

quickly expanded and further developed the payao purse-seine fishery, introducing payaos into deeper offshore waters in increasing numbers. By 1979, eight fishing companies were operating about 50 large commercial purse-seiners (250+GRT) in the Philippines, with an aggregate tonnage of over 10,000 tonnes (Aprieto, 1980).

While the tuna landings in the Philippines have increased considerably in recent years, the combination of increasing numbers of payaos being deployed further offshore, together with the rapid expansion of the purse-seine and ringnet fleet, particularly the smaller class of vessel (50 to 200 RT) has resulted in increasing catches of juvenile tunas. This has raised concern among officials and called attention to the need to monitor developments for proper assessment and management of the resource.

This document reports on the progress of the tuna sampling program in Mindanao, which includes such biological parameters as species identification, maturity and spawning, and catch stratifies and landings analysis as to species and size composition by gear.

SECTION [MARKETING]

AUTHOR [Yamanoto, T.]

TITLE [Fisheries infrastructures as incentives for artisanal fishermen to establish their own fisheries cooperative--with particular reference to a nationwide fish marketing infrastructural program in the Philippines., p. 555-583,]

SOURCE [Proceedings International Conference on Fisheries, 10-15 August 1986, University of Quebec at Rimonski, Canada, Vol. I., 1986., 566 p.]

ABSTRACT:

Since 1981, the Philippine government has launched, with the framework of an Integrated Fisheries Development Program /FEDP, Nationwide Fish Marketing Infrastructural Program, which intends to provide the fishing industry with fishing ports, ice plants and cold storages and fish transportation facilities. The program is particularly directed to the development of the artisanal fishery. A Japanese (JICA) study team has completed a physical plan for a nationwide Ice Plant and Cold Storage (IPCS) System in 1984. The management plan for the system is presented in this paper, which envisages the establishment of fishery cooperatives at the municipal level and regional and national federations of these primary fishery cooperatives.

An observation visit to the Suyawan Fishermen's Marketing Cooperative (BFMC) in Negros Oriental was useful in the formulation of the IPCS management plan. The BFMC operates an ice plant acquired through a grant from CIDA. The BFMC was considered not a real cooperative since the government pays the salaries of the cooperative personnel. The BFMC also assumes the risky business of marketing the fish bought from its members. It was suggested that the cooperative simply serve as wholesale (broker) for fishermen consigning their catch to the BFMC and auctioning the fish to invited fish dealers, middlemen, retailers, etc. This scheme may also increase the present 50% of fishermen members in the area, some of whom owe debts to brokers and middlemen. Commercial fishermen should be allowed to become associate members of the cooperative to entitle them to buy ice from the plant, thereby increasing its income. The study team also suggests that BFMC serve as the core for

fisheries development in the Bayawan Area.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Yater, L.R.]

TITLE [Problems in the Fisheries as Perceived by Fishermen, p. 51-57]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: social aspects of production and marketing (ed. C. Bailey), 1982., ICLARM Technical Report 9., 57 p., IFDR/SF/UPV, Quezon City]

PUBLISHER [ICLARM, Manila; and UNU, Tokyo, Japan]

ABSTRACT:

Problems affecting the small-scale fisheries of San Miguel Bay, Philippines, as perceived and expressed by fisherman-respondents, are discussed. Current volume of catch (1980) was compared to that of two years previous (1978). Opinions on the cause of alleged decline and possible solutions are presented. Perceptions of standards of living within the fishing communities are reported with respect to different categories of fishermen: owner-operators, part-owners of a fishing unit and crewmen.

It was found that small-scale fishermen are faced with the critical problem of declining production. They attributed this to several factors, such as presence of small and medium trawlers, increased number of fishermen, improved gears being used by other small-scale fishermen, high frequency of bad weather conditions and simply bad luck.

In describing their problems, small-scale fishermen offered their own solutions. Solutions identified by the respondents were: 1) improvement of their fishing boats and gears, and 2) regulation of trawlers. They were aware of their limitations, i.e., 1) dependence on local middlemen for financial support, 2) weak control over pricing of their own catch and 3) lack of organization to oppose the trawlers who are few in numbers but financially and politically well connected.

SECTION [SOCIOECONOMIC CONDITIONS (Industry Situationers)]

AUTHOR [Yater, L.R.]

TITLE [Field Research Methodology and Characteristics of Fishing Families p. 1-13]

SOURCE [Small-scale fisheries of San Miguel Bay, Philippines: Social aspects of production and marketing (ed. C. Bailey), 1982., ICLARM Technical Report 9., 57 p., IFDR/CF/UPV, Quezon City, Philippines]

PUBLISHER [ICLARM, Manila; and the United Nations University, Tokyo, Japan]

ABSTRACT:

The three phases of field research and the methodology employed in a study of social aspects of the small-scale fisheries of San Miguel Bay, Philippines - a broad survey followed by a detailed socio-economic survey, and

participant observation are discussed. Several characteristics of fishermen and their families are described.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Yesaki, M.]

TITLE [The Pelagic Fisheries of the Philippine Indo-Pacific Tuna Development and Management Programs]

SOURCE [1983., 15 p., ITP/83/6 (SCS/83/WP/118)]

ABSTRACT:

Estimates of pelagic fish yields in the Philippines were derived for shallow water and deep water fishing zones considering the surface area of a given body of water. Yields of tuna were compared with estimated for other areas. Landings were analyzed by fishing gears to assess the contributions of accessory devices (lights and payaos of fish aggregating devices) to the pelagic fisheries. The 24 statistical fishing areas were categorized into 6 deep water fishing areas, 9 shallow water areas, 6 Pacific Ocean coast fishing areas, and 3 South China Sea coast. The perimeter of an area was defined by the coastline, boundaries and territorial limits, and the surface areas measured from the chart with a polar planimeter. Based on the 1990 catch statistics, marine pelagic fish production from capture fisheries was 774,099 tonnes, representing 62% of the total marine landings. Highest proportion of the landings obtained from the deep waterfishings areas (55%) followed by the shallow water areas (30%), Pacific ocean and South China Sea coast (5%).

Total yields for the shallow water fishing areas ranged from 2.5 to 8.5 t/km sq. and averaged 5.6 t/km sq. Total yields for the deep water areas had considerably greater range, 0.5 to 7.1 t/km sq., and averaged 0.8 t/km sq.. The average total yield of 5.6 t/km sq. for two shallow water areas is an underestimate of the yield for the neritic regime because of the inclusion of less productive waters beyond the continental shelf (greater than 100 fathoms).

Conversely, the average total yield of 0.8 t/km sq. for deep water areas is an overestimate of the yield from the oceanic regime because of the inclusion of more productive water over the continental shelf. Yields of tuna totalled 1.2 t/km sq. for the shallow water areas, of which 0.9 t/km sq. was coastal tunas and 0.3 t/km sq. was oceanic tunas. Yields of coastal and oceanic both averaged 0.1 t/km sq. for the deep water fishing areas. Fishing gears used in conjunction with accessory devices accounted for approximately 40% of landings of anchovies, mackerels and clupeids. Landings by these gears and devices increased to 65% for coastal tunas, 70% for scads, and 90% for oceanic tunas.

SECTION [PRODUCTION AND EFFICIENCY (Resource and rent estimates situationers)]

AUTHOR [Yesaki, M.]

TITLE [The Pelagic Fisheries of the Philippines]

SOURCE [FAO/UNDP, Colombo (Sri Lanka), 1983., 21 pp.]

TEXT LANGUAGE [English]

SUBJECT DESCRIPTORS [pelagic fisheries, stock assessment, fishing gear, fishery statistics, landings statistics, tuna fisheries, gear selectivity]

GEOGRAPHIC DESCRIPTORS [ISEW, Philippines, shallow water, deep water]

ABSTRACT:

The principal objectives of this investigation was to derive pelagic fish yields for shallow water and deep water fishing zones. Yields of fishing gears are analyzed in order to assess the contributions of accessory devices to pelagic fisheries.

BIBLIOGRAPHY

(Excluding Those in the Abstracts)

- Agricultural Policy and Strategy Team. Agenda for Action for the Philippine Rural Sector. University of the Philippines at Los Baños and Philippine Institute for Development Studies, 1986.
- Alix, J.C. "Community-based Resource Management: The Experience of the Central Visayas Regional Project-I." (Eds.). Chua Thia-Eng and Daniel Pauly. Coastal Area Management Strategies and Case Studies. Manila: International Center for Living Aquatic Resources Management (ICLARM), 1989.
- Anderson, L.G. "A Comparison of Limited Entry Fisheries Management Schemes." In Report of the ACMRR Working Party on the Scientific Basis of Determining Management Measures. FAO Fish. Rep. (236): 47-74, 1980.
- Arroyo, G.M. and M. San Buenaventura. "The Economics and Social Impact of Tourism." PIDS Working Paper Series No. 83-01. Makati: Philippine Institute for Development Studies, 1983.
- Bojos, R.M. Jr. "Community-based Management of Nearshore Fishery Resources." Paper presented at the Seminar-Workshop on the Management of Nearshore Fisheries, sponsored by the Philippine Council for Aquatic and Marine Research and Development, 23-25 January 1990, Cebu City.
- Bromley, D.W. (ed.). Natural Resource Economics. USA: Kluwer Nijhoff Publishing, 1986.
- Chong, K. and M.S. Lizarondo. "Input-Output Relationships of Philippine Milkfish Aquaculture." In IDRC, Aquaculture Economics Research in Asia, proceedings of a workshop held in Singapore, 2-5 June 1981.
- Clark, C.W. "The Economics of Over-Exploitation." Science, (1973): 630-34.
- Cruz, W.D. "Technical and Institutional Change in Renewable Resource Development (with Application for Traditional Fisheries)." Unpublished dissertation, University of Wisconsin-Madison, USA, 1982.
- Fortes, M.D. "Ecological Assessment and Cultivation of Seagrasses at Bolinao Bay for Biomass Production." NRCP Research Bulletin 39, No. 1 (1984): 60-112.
- Malig, J.B. "Major Economic Fisheries Management Problems in the Philippines." Paper presented at the Asian Fisheries Social Science Research Network (AFSSRN) Conference, 27 November 1989, Center for Research and Communication.

- Ng, M. Measurement of the Ocean Contribution to the Philippine Gross National Product: A Pilot Project. Environment and Policy Institute, East-West Center, Hawaii, 1980.
- Padilla, J.P. and M.S. delos Angeles. "Economic Sustainable Development of the Philippine Coastal Resources." Forthcoming PIDS Working Paper, 1990.
- Panayotou, T. "Management Concepts for Small-Scale Fisheries: Economics and Social Aspects." U.N. Food and Agriculture Organization Fisheries Technical Paper No. 228. Rome, 1982.
- Philippine Institute for Development Studies (PIDS)-National Statistical Coordination Board (NSCB). Final Report on the Results of the Regional Seminar-Workshop Series on Agricultural Statistics. Manila, 1989.
- Primavera, J.H. "Aquaculture and the Coastal Environment." Paper presented at the Seminar-Workshop on the Management of Nearshore Fisheries, 23-25 January 1990, Cebu City.
- Sayson, P.R. "The Economics of Shifting from Bangus (*chanos-chanos forskal*) to Sugpo (*penaeus monodon fabricus*) Farming: Prospects and Problems, Benefit/Cost Analysis Approach." Unpublished paper submitted to the Program of Development Economics, School of Economics at the University of the Philippines, Diliman, Quezon City, 1984.
- Signey, L. "Philippines: Price-weighted Output Index for Marine Fisheries." Paper presented at the IPFC/FAO Symposium on the "Exploitation of the Marine Fishery Resources in Southeast Asia," Darwin, Australia, 16-19 February 1987.
- Silvestre, G. and D. Pauly. Estimate of Yield and Economic Rent from Philippine Demersal Stocks (1946-1984) Using Vessel Horsepower as an Index of Fishing Effort. International Center for Living Aquatic Resources Management, 1988.
- Tomboc, C.C. "The Effects of Mangrove Forestation on Nearshore Fauna." Paper presented at the Seminar-Workshop on the Management of Nearshore Fisheries Resources, 23-25 January 1990, Cebu City.
- The World Bank. Philippines: Environment and Natural Resource Management Study. World Bank-IBRD, Washington D.C., 1989.